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The Bristol
Medico-Chirurgical Journal

*"Scire est nescire, nisi id me
Scire alius sciret."*

SPRING, 1929.

SOME POINTS ON THE CARE AND TREATMENT OF MENTAL DEFECTIVES.

The Presidential Address, delivered on 10th October, 1928, at the opening of the Fifty-sixth Session of the Bristol Medico-Chirurgical Society.

BY

H. L. ORMEROD, M.D., B.Ch., M.R.C.S., L.R.C.P.

MY first duty is to thank you for the very high honour you have conferred upon me by electing me President of this Society. It is an honour which I value all the more when I recall the fact that very few general practitioners have held the office.

"Mental defectives, their care and treatment" is a subject that has been somewhat forced upon me during the last few years, and as it is a matter of importance to all members of the medical profession as citizens, I am venturing to use some points under this heading as the basis of my address to you to-night.

History.[1]—By the ancients mental defectives were regarded as objects of derision, aversion, or persecution. The appellation "idiot" not only inspired horror and disgust, but meant, for the unfortunate, a forfeiture of all human rights and privileges. So, in the belief that they were accursed of the gods, or in an effort to preserve the integrity of the race, the practice became common, and still exists among certain nations, of allowing the mentally deficient to perish, or, as was done in Sparta, of directly exposing them to a death peril. Traces of this custom, found in the laws of Lycurgus, were not confined to Sparta alone. Cicero intimates its existence among the Romans. At the present day a similar custom exists among certain of the South Sea Islanders, and is common among a tribe of American Indians distinguished for their intelligence, strength, and physical beauty.

The dawn of Christianity was, for the idiot, the first gleam of commiseration and pity, and the charge of St. Paul to "comfort the feeble-minded" is believed by some to apply more to these unfortunates than to those weak in the faith. In direct accord with this, three hundred years later we find the Bishop of Myra, the St. Nicholas of the children of to-day, recognizing and tenderly caring for the idiot and the imbecile. In medieval times, as fools and jesters, they had the freedom of the castles of the great, and wandered unmolested in Europe, as in the Orient.

Again, viewed with superstitious reverence, and even fear, as being mysteriously connected with the unknown, the house into which an imbecile was born was considered blessed of God, and it was a commonly accepted belief that these creatures walked on earth, but held

their conversation in heaven. Among the Turks of to-day, and in parts of Ireland and Brittany, the same idea prevails. In Brazil an imbecile in a family is considered more of a joy than a sorrow. Rich and poor alike roam the streets undisturbed, soliciting alms, which are never refused, and in this way, among the poor, an idiot may be the sole support of a family.

Confucius and Zoroaster in their writings both enjoin a tender care of these unfortunates; and the Koran gives this special charge to the faithful: "Give not unto the feeble-minded the means which God hath given thee to keep for them, but maintain them for the same, clothe them, and speak kindly unto them."

During the reign of Edward II we find it enacted that "The King shall have the custody of the lands of natural fools, taking the profits of them, without waste or destruction, and shall find *them* their necessaries, of whose fie soever the lands be holden; and after the death of such idiots, he shall render the same to the right heirs, so that such idiots shall not be aliene, nor their heirs be disinherited, and a portion shall be distributed for his soul, by the advice of the Ordinary." But again persecution follows close upon the steps of superstition, and even in the days of the Reformation we find Martin Luther and Calvin denouncing them as "filled with Satan."

Although many individual acts of kindness may have passed unnoticed during the lapse of ages, the first intimation of organized effort is found in the middle of the seventeenth century, its birthplace France and its cradle the Bicêtre, the present large asylum and hospital of Paris. Obtaining from Anne of Austria permission

to use as an asylum for foundlings this ancient château, upon the ruins of which Richelieu had begun the foundation of a military hospital, St. Vincent de Paul and his confrères gathered there the children from the city and the provinces, the homeless, the outcast, and the feeble alike in mind and body.

The first attempt at any mental training was in 1828 by Guggenmoss of Salzburg, but his efforts failed from lack of aid and encouragement. In 1836 Guggenbühl, a young physician of Meilen in Zurich, after working for some time upon cretinism, became convinced that much could be done for mind and body by systematized effort, and determined to found a hospital, which was eventually built on the Abendberg, near Interlaken, in 1842. Accounts of its success quickly spread abroad, and within a decade institutions arose in America, England, Germany, and other countries of Europe.

In England in 1843 articles written by a Dr. William Twining called the attention of his countrymen to the work being accomplished at the Abendberg, and three years later, in 1846, the Misses White opened a private school for defective children in Bath. In 1847 the Rev. Andrew Read, who in the midst of his work for orphans had found time to study also the needs of defectives, journeyed to Abendberg for observation and conference. On his return, at a meeting held on 7th October at which the Lord Mayor of London presided, he was so successful in enlisting the sympathies of many, that a committee was appointed to consider ways and means for practical work. The following April, 1848, Park House, Highgate, was opened as a temporary home, with twenty-seven children. This in 1850 was removed to Essex Hall near

Colchester, and became the asylum for the eastern counties. In 1853 the corner-stone of the present institution of Earlswood was laid, to be followed in the sixties by Starcross for the western counties, the Royal Albert Asylum at Lancaster and the Knowle at Birmingham for the northern and midland counties respectively.

The Present Day.—A very definite advance in the care of the mental defective was made on 1st April, 1914, when the Mental Deficiency Act of 1913 came into operation. It[2] was a drastic remodelling of the recommendations of a Royal Commission on the care and control of the feeble-minded, whose report was issued in 1908, after a prolonged investigation. Prior[3] to this Act idiots and imbeciles were provided for by two statutes, namely the Idiots Act 1886 and the Lunacy Act 1890. The education of mentally-defective children was also sanctioned by the Defective and Epileptic Children Act of 1899; but the largest and most important class of all, that of the adult feeble-minded, was not recognized, and the absence of any legalized provision for their systematic care and control caused no little hardship to the defectives themselves, besides being a source of very considerable danger to the welfare of the community.

In 1920 a Mental Deficiency (Amendment) Act was passed, and finally the Mental Deficiency Act 1927. By this Act mental defectiveness is defined as "a condition of arrested or incomplete development of mind, existing before the age of 18 years, whether arising from inherent causes or induced by injury or disease." The mentally defective are divided into the four following groups:—

(1) Idiots.

(2) Imbeciles.

(3) Feeble-minded persons, that is persons in whose case there exists mental defectiveness, which although not amounting to imbecility, is yet so pronounced that they require care, supervision and control for their own protection or for the protection of others; or, in the case of children, that they appear to be permanently incapable, by reason of such defectiveness, of receiving proper benefit from the instruction in ordinary schools. These are capable in many ways of earning a living under favourable circumstances, but are incapable from mental defect of (*a*) competing on equal terms with their normal fellows, or (*b*) of managing themselves and their affairs with ordinary prudence.

(4) Moral defectives, that is persons in whose case there exists mental defectiveness coupled with strongly vicious or criminal propensities, and who require care, supervision and control, for the protection of others.

In connection with the definitions,[4] the Board of Control desire to emphasize the fact that mental defect, within the meaning of the Act, may exist in persons of some or even considerable intellectual capacity. The criterion, except in the cases of feeble-minded children, is whether the individual is so mentally defective that he or she requires care, supervision and control.

With regard to the moral defectives,[5] this class is one of great practical importance by reason of its comparative frequency and the serious results which may attend its proclivities. A medical practitioner

may at any time be brought into contact with a member of this class, either to make a diagnosis, to give evidence in a court of law, or to advise as to certification. At first sight it might appear that the question who were or were not moral defectives within the meaning of the Act would present very little difficulty, but as a matter of fact it is far from simple. Many moral defectives are so cunning, so plausible, and not only so seemingly intelligent but really intelligent, that mental defect, as ordinarily understood, would appear to be quite out of the question. But the definition speaks not of intellectual defect, but of mental defect.

There is a great difference between these terms, for a mental defect is clearly a defect of any of the complex faculties which go to the make-up of mind; whilst an intellectual defect concerns certain particular faculties of mind only. A person who is able to make normal progress at school, who is able to read, write, and reckon, up to the average of his class, who can comprehend and hold intelligent converse upon current events, is commonly regarded as being free from any intellectual defect; he may, nevertheless, have a prominent mental one, for normal mind is made up of more than this. It embraces a higher intellectual quality called by Mercier "wisdom," a quality that guides and governs the higher and more comprehensive phases of conduct, that regulates the main business of life in adaptation to circumstances, that teaches us how to act, so that in the long run, and on balance, our lives will be successful, and in this quality, which is not only a mental but also an intellectual quality, the moral defective is always deficient.

The cardinal feature of moral defectives is the combination of this mental defectiveness, which must have existed before the age of 18 years, with strongly vicious or criminal propensities requiring care, supervision, or control for the protection of others. Broadly speaking, we may say that a criminal act is one which violates the law, whilst a vicious one is one which is inimical to the well-being of society, although not necessarily illegal.

In an interesting paper on this class of defectives Tredgold[6] describes two distinct clinical types: (1) those due to defect of moral sense, and (2) those due to defect of will. Referring to the crimes and vices to which the defect of moral sense may give rise, he says: "To enumerate all of them would practically be equivalent to writing a catalogue of all the misdeeds of which erring human nature is capable; for there are few, if any, which have not been committed by mental defectives of this type." Even as quite young children they are never to be depended on to tell the truth, and although some of their lies are directed towards the achievement or covering-up of some particular wrongdoing, they will lie equally readily about the most trivial things, when the truth would serve their purpose equally well, or even better. Similarly children of 8 or 9 years, or even less, will use the foulest language, they will rob orchards, or gardens, pick pockets, steal from shops, set fire to hayricks, ill-treat and torture animals and children smaller than themselves in the most fiendish manner, take a malevolent delight in annoying those of older years, and generally behave in such a manner as to be a terror to the neighbourhood. Those who go to public

schools will be expelled for immoral practices, thieving and incendiarism.

Later, with the growth of knowledge and physical strength, the capacity for crime of these persons becomes increased, and they will embezzle, forge cheques, wreck trains, mutilate cattle, and commit murder. Far from being mentally defective, in the ordinary sense of the word, they are so cunning and scheming in the commission of their crimes as to make detection exceedingly difficult. When taxed with an offence, they will invent the most plausible excuses, and evince a quickness of wit or a degree of imagination of no mean order, whilst in their general attainments some are actually brilliant in certain directions.

There is one quality, however, which never fails to distinguish them, and that is the absence of shame and remorse. Caught red-handed, some of them will admit their guilt in the most bare-faced manner, others will plausibly attempt to explain their actions, and a few may express contrition; but none of them really feel any shame, and they will repeat the offence the next moment, if given the opportunity. Personal honour, social obligation, patriotism, are quite unintelligible to them, and the lack of the restraining influence of moral sense causes the whole of their conduct to be made up of actions based upon the desires of the moment, quite regardless of the effect these may have upon their fellow-beings or upon society.

The second group are those in whom there is a defect of will. Of these we may recognize (*a*) those persons who in consequence of a general weakness of

will are unable to resist the ordinary temptations to social misconduct which are inseparable from every-day life, and whose behaviour will be entirely dependent upon the nature of their environment, and (*b*) those persons who are the victims of certain morbid obsessions and imperative ideas, urging them to the commission of certain anti-social acts: included in this class are kleptomaniacs and dipsomaniacs.

The methods of control provided by the Act are two: (1) detention in institutions; (2) placing under guardianship.

Mental deficiency inevitably costs the nation money, for at a low estimate[7] one per thousand of the population need institutional provision, and the kindest and most economical way for suitable cases is institutional care. Neglect to deal with this problem[8] means a cost in misery, vice and industrial inefficiency which cannot be properly estimated; and all the time the problem becomes more serious, and is bound in the long run to affect our position among the great nations of the world.

It is,[9] however, difficult in many cases to convince the members of councils that the expense of maintaining the feeble-minded who cannot maintain themselves must eventually be borne by the community, and that it is a choice between maintenance under improper conditions in Poor Law institutions, prisons, by outdoor relief or an unemployment benefit, or maintenance in institutions where they are under continuous training and care. The present methods of supporting the mental deficients leave them free to cause grave social evils by their delinquencies and degradations, and to produce children who in turn

may have to be supported out of the rates. In and out of prison or a Poor Law institution, sometimes receiving outdoor relief, sometimes charity, exposed to temptations they have no power to resist, a misery to themselves and a source of danger to their neighbours, these afflicted persons should be the first charge on any civilized community. Under proper treatment it is possible by early and continuous care and training, not to cure them, but to make them harmless, happy, and to some extent useful.

Defectives[10] are admitted into *institutions* for (1) training, (2) custodial care, according to their grade.

The objects of the treatment are: (1) to arrest their anti-social conduct; (2) to develop their self-respect and ensure their happiness; (3) to teach them various kinds of work for which they are best fitted by reason of their mental and physical condition, and to lead up to their discharge, if possible; (4) to prevent the procreation of children, and so to stop the handing on of the blight to successive generations.

Institutional treatment comes under three heads: (1) medical, (2) occupational, (3) recreational.

(1) *Medical* treatment consists of a regular "overhaul" to treat any disability present—physical drill for men; dancing for women and girls, healthy outdoor exercise.

(2) *Occupation.*—It is astonishing how quickly defectives go downhill mentally and physically if they are not suitably occupied.

(*a*) *Children.*—There is school for those who are able to benefit by continuing their elementary educational work, together with various forms of

handicraft, physical training, gardening and organized games. The training of low-grade defectives is not directed to the attainment of a knowledge of reading, writing and arithmetic, nor that of ultimate industrial efficiency; it is nevertheless essentially practical, in that it aims at producing in the children happiness and self-control, and, as a result, makes them no longer a dead weight on those who have the duty of caring for them. To attain this end attention is especially directed to the following points:—

(i.) The inculcation of habits of cleanliness and obedience; (ii.) the fostering of greater self-reliance by teaching the children to help themselves, and not to be entirely dependent on others; (iii.) the provision of legitimate outlets of energy, which if left undirected too often expresses itself in destructiveness and spitefulness; (iv.) the teaching of mutual helpfulness and consideration.

(*b*) *Adults.*—Endeavour to place them in an occupation that will benefit their mental and physical condition, and will turn them from useless and often troublesome members into persons doing their own share of the work of the community. Great importance must be placed on the fact that the amount of work done by any individual is of very much less importance than the fact that he is fully occupied. There is, of course, always domestic work for both men and women, and out-of-door work on the land. It is a great stimulus to defectives actually to achieve the making of something; hence employ as many as possible in workshops at such work as mat-making, brush-making, tailoring, shoe-making, also with the painters and engineers of the institution. Women can work in

the laundry, kitchen, bakehouse and administrative quarters, also in the sewing-room and garden.

(3) *Recreation.*—As we have to teach the patients to work, so we have to teach them to play by means of organized games amongst themselves and by matches with outside clubs. The monotony of institutional life can be relieved by concerts, dances, and walks outside.

Guardianship, properly provided, seems adequate care and protection for a certain type of case, and makes for the greater happiness of the individual and for economy in the administration of the Act. This form of care is of use for the higher grade defectives, who, whether on licence, in institutions or elsewhere, have shown themselves able to live safely in the community, but who require some measure of support and control. It may also be used for low-grade cases as an alternative to institutional care and supervision, where the home conditions are good and where suitable guardians are available; and may be found useful in those cases where a small regular payment enables parents to provide proper care for the defective at home. Attendance at an "occupation centre" when possible is found to render supervision more effective in guardianship cases.

The principal factors in deciding whether non-institutional care will prove adequate protection are the character of the defective; his past history, temperament, moral characteristics and behaviour; his capacity for work, and the possibility of his procuring suitable work; also the nature of the parent or guardian, the home surroundings and the efficiency of the supervision provided.

There are two other forms of preventive treatment, besides that of segregation, on which I should say a few words, they are (1) sterilization, (2) the regulation of marriage.

Sterilization[11] as a means of preventing procreation has been advocated by certain responsible persons, and repudiated by others; but even assuming that this policy were desirable, it is obvious that it could not be put into operation in the absence of a pronounced public opinion in its favour, followed by the necessary legislation.

The advocates of sterilization, and consequent discharge from institutions, as a wholesale remedy for the problem of mental deficiency, and as an alternative measure to segregation, can be answered briefly as follows. (1) The great majority of mentally defective persons require protection, care, and control, on account of their incapacity to maintain an independent existence, apart from the question of the procreation of children. Sterilization will not make a mental defective competent, an inebriate sober, or a criminal moral. (2) Unrestricted freedom in a large number of cases at present under care would lead to a return to the conditions prevalent before the passing of the Mental Deficiency Act. Sterilization would not prevent these persons from leading useless and harmful lives, in and out of Poor Law institutions, prisons, hospitals or refuges, or from spreading venereal diseases. (3) As far as the immediate expense is concerned, the economic burden to the State is not likely to be lessened by discharge of the sterilized mental defective. Care in an institution where his limited capacities are made full use of, and where he may be trained for partial independence, is probably

the cheaper method of treatment. (4) Discharge would not increase the happiness of the majority of the patients at present under care in institutions. (5) Sterilization as a compulsory measure is likely to arouse public opposition, but without compulsion it is probable that the objections of the parents of the patients would render the scheme impracticable on any large scale.

An aspect of the question which is perhaps worthy of consideration is whether it is desirable to allow sterilization, not as an alternative, but as a complementary measure to segregation. The procreation of children by defective parents not only causes immediate individual suffering, but is likely to entail a permanent and increasing burden on the community. Children of defective parents, even if not definitely certifiable, are likely both from the point of view of environment and inheritance to find their level in that stratum of society whose increase at the expense of the self-supporting sections constitutes a serious menace to civilization and progress. That this danger cannot at present be entirely eliminated, except by segregation in colonies, has been proved.

On the other hand, it is clearly impossible under the present law, and the state of public opinion, to provide institutional care for all our defective population, even if it were desirable, and the question arises whether in cases where permanent institutional care is now only necessary in order to prevent the risk of procreation, sterilization, followed by return to some form of community life, on licence, under supervision or guardianship, might not be the most humane and expedient course to adopt.

Taking[12] all things into consideration, it has been estimated, on high authority, that the number of defectives now detained in institutions who could be discharged merely by reason of sterilization cannot be higher than 3 to 5 per cent., and probably the smaller figure is the more correct of the two.

To sum up:[13] whether voluntary sterilization would be accepted by defectives and their parents, whether it would be sanctioned by public opinion and Parliament, whether it would increase the health and happiness of those sterilized, are questions which call for careful study and investigation. The aspect of the question which is more frequently emphasized is the economical one. To this undue weight is being given, for sterilization would not obviate the need for supervision and industrial training, and the number for whom it would render institutional provision unnecessary is greatly exaggerated.

There can be no two opinions[14] as to the undesirability of the *marriage of defectives*, who have been certified as unable to manage themselves and their affairs, or as needing care, supervision, and control. To place such persons in control of others, especially of helpless children, is the height of unwisdom, and the negation of the aims of a civilized community. It has been suggested that it should be made a punishable offence to marry or connive at the marriage of any person known to be certified as a mental defective, but even if the law were so altered, it is very doubtful if public opinion is sufficiently informed to enforce it.

It may be said that legal prohibition would only partially check their propagation, because a large

number of their offspring are illegitimate; but that considerable benefit to the State would result cannot be doubted. The procreation of children by unmarried defectives, deplorable as it is, has not, as a rule, the same evil consequences to the children as those of married defectives. In the former case the children are generally brought up apart from their parents under Poor Law or other institutional care, and at the present day are given the chance of as full development as possible, morally, physically and mentally. On the other hand, those who are the offspring of married defectives remain under the control of persons who are incapable of taking care of them; and they are consequently exposed to the hardships, neglect or ill-treatment that the mental condition of their parents renders inevitable.

Laws[15] regulating the marriage of mental defectives do already exist in some European countries and in several of the states of America, and although it is difficult to obtain definite information as to their working, and opinions differ somewhat as to their value, there seems to be little doubt that on the whole they have been productive of good, and have not only helped to educate the conscience of the community, but have prevented many undesirable persons from getting married.

I do not think that I can do better than close with the following passage from Tredgold's *Mental Deficiency*.[16] He says:—

"I am convinced that the nation which wishes to escape degeneracy will sooner or later have to give serious attention to the matter of the innate constitution of its citizens, and the manner in which that

innate condition may be controlled by laws concerning marriage.

"So long as we are content to raise no voice against the marriage of the diseased, the degenerate, the habitual criminal, and the chronic pauper, and are willing to educate, feed, clothe, and ultimately pension as many offspring as these persons see fit to produce; so long as legislation is permitted a free hand in doing everything calculated to diminish parental and social responsibility, and to strike at the very root of any incentive to labour; so long as our lawmakers and would-be philanthropists are blind to the folly of transferring the burdens and penalties inevitably following carelessness, improvidence, indifference, drunkenness and unlimited selfishness from the shoulders of those upon whom they should rightly fall to the careful, provident and industrious members of the State—then so long will these classes (and these qualities) continue to be perpetuated, and their numerical ascendancy is simply a question of time."

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RADIUM AND ITS SURGICAL APPLICATIONS.*

BY

H. S. SOUTTAR, C.B.E., F.R.C.S.,

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THE discovery of radium by Madame Curie in 1898 opened up a field of physical research the limits of which it is impossible to see. Although it was found at an early stage that radium had a definite action upon living tissues, this appeared to be purely destructive, and it is only recently that the selective action of radium upon cancer cells has been adequately demonstrated. Depending as it does upon γ rays, this selective action involves the use of screens to cut out those rays which are purely destructive, and the success of modern methods has depended very largely on accurate methods of screening. So great has been this success, that it marks a new epoch in the treatment of malignant disease, and it would seem that its extension to the general treatment of cancer is only a matter of discovering suitable methods of application.

The most remarkable property of radium is the fact that it steadily decays, and passes through a series of gradations, some of them far more active than radium itself, ultimately becoming inert lead as the final product of its disintegration. Radium itself stands half-way in the series of disintegration products,

* From a Paper read at a Meeting of the Bristol Medico-Chirurgical Society held at the University of Bristol on 12th February, 1929.

descending from uranium and finishing as lead. Taking as representative of each product the period required for half the element to disappear, the "half-value period" varies between five thousand million years for uranium, 1,750 years for radium and three minutes for radium A. For radon, the immediate and by far the most important product of radium, the "half-value period" is 3·85 days, and it is to the rapid decay of this product that we owe the surgical possibilities of radium. The radiation thrown out by radon as it disintegrates has the extraordinary power of selective destruction of cancer cells.

To understand the meaning of "decay" it is necessary to grasp the modern conception of the atom as a minute solar system in which the nucleus is the sun, whilst the electrons whirling round it are the planets. The nuclei are complex structures built up of protons and electrons, each carrying respectively an exactly equal positive and negative charge, whilst the planetary electrons, each carrying the same negative charge, are identical with β particles.

The simplest atom of all is the hydrogen atom, consisting of a single proton as nucleus, with a single electron flying round it. Next in order comes the helium atom, its nucleus built up of four protons and two electrons welded together, whilst its planetary system consists of two electrons whirling round the nucleus. To us its importance can scarcely be exaggerated, for the nucleus is identical with the α particle, so that an α particle may be regarded as a helium atom deprived of its two planetary electrons, whilst it does not require much imagination to see that it must carry a positive charge exactly double the negative charge carried by each electron. When we point out that the electron, set free to fly through

space, is the β particle, and that with its liberation is bound up the production of γ rays, it will be realized that the helium atom carries in miniature the whole physical basis of our subject.

Contrasted with these simple structures, the radium atom presents an enormous complexity. Its nucleus is a dense cluster of 226 protons and 138 electrons, some at least of which are grouped together to form α particles, whilst around this nucleus whirl no fewer than 88 electrons. The formation is unstable, and α particles are being constantly discharged from the nucleus, β particles from the nucleus and from the planetary system. As each particle is projected into space the characters of the atom are changed. It is no longer radium but one of its derivatives, and this is the physical interpretation of "decay." Radium becomes radon, radon becomes radium "A," which is so unstable that within a few minutes it has lost an α particle and become radium "B." Finally, stability is reached in an atom indistinguishable from that of lead, and so far as we know no further change occurs.

One is apt, however, from such a description to gain an entirely false impression of the relative dimensions of the atom and its nucleus. The most extraordinary thing about this complex structure is the minute space occupied by the nucleus and the electrons, so minute indeed that our comparison with the solar system scarcely leaves enough room. Accurate measurements of the dimensions of the hydrogen atom show that it may be fairly represented by one golf ball circling round another in an orbit a mile across. On the same scale the diameter of a single tissue cell would be about one hundred thousand miles. When we talk about the impact of β particles, it is well to bear these facts in mind, and to remember also that the tissue cells

themselves are made up of atoms as empty as those we have described.

We are now in a position to understand the property of radium which gives to it for us its peculiar value, the radiation which accompanies decay. As we have seen, it takes three forms, the α, β, and γ rays, and we may now sum up briefly the very different characteristics of these three forms.

The α rays consist of particles identical with the nucleus of helium, each carrying a positive charge of electricity, and they are projected from the nucleus with a velocity of 10,000 miles a second. In spite of this terrific velocity, they have little power of penetration, and are stopped by a thin sheet of paper. Even in the air they rarely travel farther than a couple of inches, so that although they carry the great bulk of the energy produced by the dissolution of radium, they are of no practical value in surgery.

The β rays are formed by electrons, of very small mass, carrying a unit negative charge of electricity, and projected with any velocity up to 180,000 miles a second, falling just short of the velocity of light. The soft rays of low velocity are easily stopped by a thin sheet of aluminium, but the hard rays of high velocity can pass through 0·2 mm. of silver. All but a small percentage of β rays are, however, stopped by 0·3 mm. of platinum or by a centimetre of the body tissues. Their surgical action is therefore very local, and it is often better to avoid it altogether by the use of screens.

The γ rays are ether waves of exceedingly short wave length, less than 1/5000 of that of light. They are set up apparently by the discharge of the β particles, they travel with the velocity of light, and their power of penetration is so great that they are scarcely affected by the screens which almost abolish γ rays, they can

pass through several inches of lead, and they are only reduced by about 50 per cent. in passing through four inches of the body tissues.

It is thus upon the β and the γ rays that the surgical action of radium depends. The former are destructive in their effect, and they are chiefly used in surface applicators for the production of superficial scarring. The γ rays, on the other hand, have two very remarkable effects: they stimulate the activity of the tissue cells, and especially the production of fibroblasts, and they have a definite selective action on tumour cells, probably at the moment of their division, causing them to disintegrate and disappear. Their total effect when they can be suitably applied is to cause the disappearance of a malignant tumour and its replacement by a scar.

We must say one word more about radon, the emanation of radium and the essential agent through which it acts. It is a heavy, inert gas with no chemical affinities, and it decays with such rapidity that in 3·85 days one-half of it has vanished, whilst at the end of 9 days only a fifth remains. So long as it remains in contact with radium the decay is made up by production, so that after a certain time equilibrium is established. If radium is left undisturbed this is reached in about a month, and thereafter production and decay exactly balance. At this stage radium has reached its maximum radio-active power, and the radio-active power of a milligramme of element is defined as a millicurie.

The fact that radon can be separated from its parent radium and packed into minute containers is of great practical value. So minute is its bulk that one thousand millicuries only occupy the space of 0·6 of a cubic *millimetre*, so that it can be put into capillaries of

infinitesimal dimensions. Its action is identical at any moment with that of a certain amount of radium, but its power is constantly diminishing, so that in 3·85 days it is down to one-half and in 9 days to one-fifth. This, however, is easily neutralized by starting with a larger dose, and 1·5 millicuries of radon gives a total radiation equal to that of one milligramme of element left in for a period of eight days.

APPARATUS AND MODES OF APPLICATION.

The apparatus used in the application of radium is of the simplest description, and, excluding the flat applicators which are chiefly used by dermatologists, it consists principally of needles containing radium element and seeds containing radon gas.

Needles are small platinum tubes varying in diameter from 1·5 to 3 millimetres, with a point tipped with iridium, and an eye through which a stout silk thread can be passed. A small cavity occupies the whole of the needle except the eye and the point, and this is packed with insoluble radium sulphate, the utmost care being taken to secure absolute uniformity in packing. The wall of the needle should be not less than 0·5 millimetres in thickness, so as to cut off the whole of the β rays. The length of the needle will vary with the requirements of the case. At the London Hospital our needles are 2, 3, 4 and 6 centimetres in length, and we have the convenient arrangement that each needle contains one milligramme of radium per centimetre of length.

Seeds are minute capsules containing radon gas. Usually the gas is sealed up into a tiny glass capillary, which is then inserted into a tube of platinum, gold or silver, to cut off the β radiation. Theoretically platinum is the most efficient screen, but personally I have found

silver screens entirely satisfactory. Silver presents the advantages that it is cheap and easily worked, and I have recently elaborated a plan by which the radon is drawn directly into a long silver tube, which is then cut up into suitable lengths. The method of cutting ensures an absolute seal, and the saving of time and trouble, and of personal risk to the laboratory assistant, is considerable.

These needles and seeds provide small sources of γ radiation which may be either introduced into the tissues or fitted into external applicators.

Introduction into the tissues is controlled by the empirical observation that the γ radiation from a milligramme of radium can in a period of about five days destroy the cancer cells in a cubic centimetre of tissue. The total amount of radium required in milligrammes is thus the volume in cubic centimetres of the tissue to be irradiated, although in the case of large growths, from the effect of cross radiation, a smaller amount will suffice. It must be distributed evenly, the needles or seeds being placed about two centimetres apart, and it must be placed chiefly in the growing edge of the tumour. The needles are attached to stout silk threads, since they contain radium element and their loss would be disastrous. The seeds may be attached to fine silk threads and be removed later, or they may be simply inserted and left in the tissues, where under most circumstances they do no harm. The insertion of seeds is less likely to be followed by the slight sepsis which sometimes follows the insertion of needles, whilst they have the great advantage that the patient can go home. The action of the needles is, however, uniform and not diminishing, and on this account they are preferred by some surgeons.

The treatment of a case of carcinoma of the breast

furnishes an excellent example of the introduction of radium needles. The diagram (Fig. 1) indicates the arrangement worked out by Mr. Keynes at St. Bartholomew's which has given brilliant results. Two groups of needles are inserted into and beneath the tumour itself on different planes, two rows of needles follow the lymphatics along the borders of the two pectoral muscles, a third group occupies the axilla, a fourth is inserted beneath the clavicle in the region of the costo-coracoid membrane, a fifth is placed above the clavicle, and a sixth group is inserted one in each of the upper five intercostal spaces and one in the rectus sheath. The actual number of the needles will vary between forty and fifty with the dimensions of the breast and of the tumour, and the total amount of radium between 75 and 100 milligrammes. The needles are left in place for from seven to nine days, and are then removed.

The tongue is an ideal site for the use of seeds (Figs. 2, *a*, *b*). About eight or twelve are required, each containing from 1 to 2 millicuries of radon gas, and they are inserted into the base of the growth, usually through the tongue itself. In this way the actual growing edge is subjected to an intense cross-fire radiation, whilst as access is obtained directly through the soft tissues of the tongue, the treatment of growths far back, in situations quite inaccessible to ordinary surgery, is perfectly simple. In most cases the tumour will disappear by magic, and three weeks later it will have been replaced by a contracting scar. The glands on both sides of the neck are now dissected out in the most thorough manner, and three weeks later the treatment is complete by the external application of radium needles mounted on a thick wax collar made of Columbia paste.

For the irradiation of tumours or of glandular

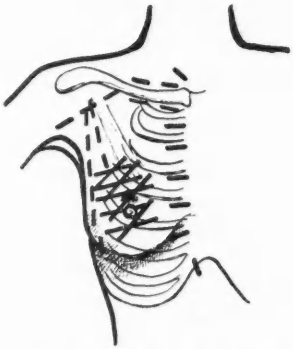

FIG. 1.—*Carcinoma of Breast.*

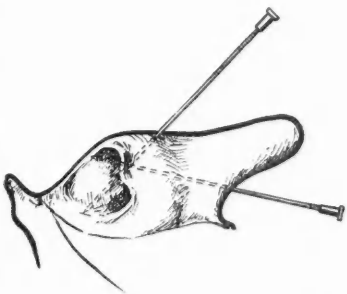

FIG. 2*a*.

Carcinoma of Tongue.

FIG. 2*b*.

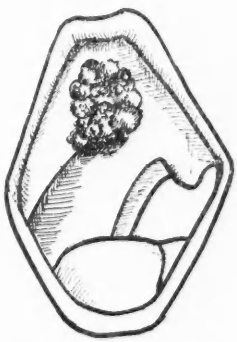

FIG. 3.—*Carcinoma of Palate.*

deposits by external application it is essential that the radium should be supported at some distance from the skin, as otherwise certain areas of the skin will receive a dose which they cannot tolerate and will break down. A convenient plan is to mould a sheet of Columbia paste —a mixture of beeswax 100, paraffin wax 100, and pine sawdust 200—to the region. The wax should be 1·5 centimetres thick, and on its outer surface radium needles should be planted, screened in the ordinary way with 0·5 millimetres of platinum. Small needles containing from 0·5 to 1·5 milligrammes of radium should be distributed at a distance of 1 centimetre apart over the surface, whilst special regions, such as the eye or nose, can be protected by the introduction of thin lead plates into the wax mould. The whole appliance should be covered with a thin sheet of lead for the protection of the nursing staff. Even more convenient than wax in many cases is a sheet of spongy rubber; it has the great advantages of lightness and adaptability, and the needles are easily attached to it by strapping. The period of application varies with the strength of the needles and the requirements of the case from a few hours to a month.

The most dramatic method of applying radium is by the concentration of several grammes into a "Radium bomb," which is virtually used as a source of intensely hard X-rays, the patient being placed at a distance of a foot or more from the centre of the bomb. In the arrangement devised by Dr. Cheval of Brussels 4 grammes of radium are embedded in the centre of a huge block of lead weighing over a ton and supported on steel girders in the ceiling of one room and the floor of the room above. A double cone cut in the lead allows of the exposure of two patients to intense γ ray radiation, one above and one below. So long as the

attendants keep outside the cones, which are marked out by circles on the floor and on the ceiling, they are perfectly safe, whilst by an ingenious arrangement the radium itself can retire into a recess in the lead block or advance to the centre of the cone. The method is costly and very extravagant of radiation, but the results are said to be extremely good.

THE CLINICAL RESULTS OF TREATMENT BY RADIUM.

The results of radium treatment in cases of rodent ulcer and carcinoma of the cervix of the tongue and of the breast are well known, and have been fully described in recent articles. I shall confine myself to describing certain cases of my own in regions where surgery would be difficult or impossible, as I think that one can thus best illustrate the wide range over which radium can be used with success.

Carcinoma of the Palate. (Fig. 3.)

A man aged 55 came to see me last April complaining of a discomfort in the palate of three weeks' duration. At the junction of the hard and soft palate, and extending on to both and on to the alveolar margin, on the right-hand side, was a hard nodular mass of ulcerated fungating carcinoma. There was a large mass of hard glands in the right anterior triangle of the neck. The tumour was destroyed with my steam cautery and the glands were dissected out completely. Healing was perfect in a fortnight, but three weeks later the tumour recurred.

In May I inserted into the base of the tumour six radon seeds, each containing 1·5 millicuries of radon. In fourteen days the growth had disappeared, and was replaced by granulations, in three weeks healing was complete, in six weeks there was no trace even of a scar and he was wearing his toothplate. He remains in perfect health, with no sign of recurrence.

Epithelioma of the Lip. (Fig. 4, *a*, *b*.)

A man aged 65 was sent to me last September with a huge mass of growth involving the whole of the lower lip and

FIG. 4*a*.

FIG. 4*b*.

Epithelioma of Lip.

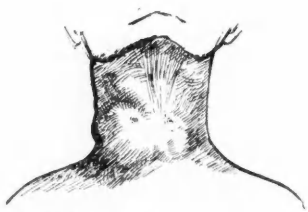

FIG. 5*a*.

FIG. 5*b*.

Carcinoma of Thyroid.

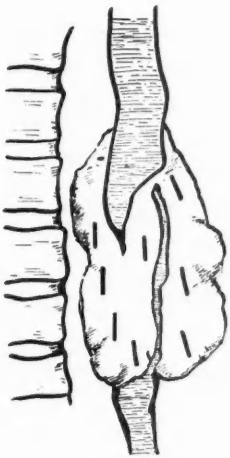

FIG. 6.
Carcinoma of Œsophagus (from X-ray photograph).

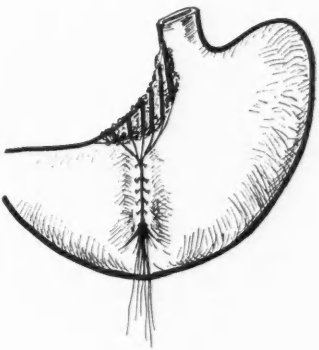

FIG. 7.
Carcinoma of Stomach.

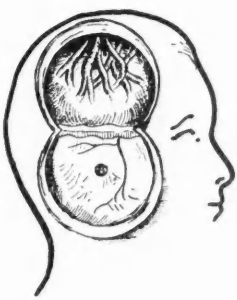

FIG. 8*a*.

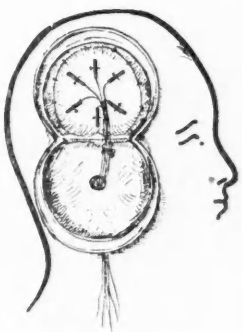

FIG. 8*b*.

Angioma of Meninges.

extending almost to the chin. It had started a year previously as a small nodule at the left corner of the mouth. Six needles, each 2 centimetres long and containing 2 milligrammes of radium were inserted into the lip along the margin of the growth and were left in place for a week. In three weeks the great bulk of the growth had disappeared, but a week later two small nodules still remaining were treated by the insertion of small radon seeds. A fortnight later the glands were cleared out from both submaxillary triangles, and as the margin of the lip was very ragged, a narrow strip was taken from it. In such an advanced case a permanent cure is too much to expect, but the immediate result was remarkable, and from the cosmetic point of view it was extraordinarily good. A remarkable feature was the reappearance of a lip apparently destroyed by carcinoma, demonstrating conclusively the selective action of the radiation employed. No visible carcinoma remained, and should recurrences appear they can probably be dealt with by similar means.

Carcinoma of the Thyroid. (Fig. 5, *a*, *b*.)

A lady aged 70 came to me last September with the history that a small swelling which had always been present in the neck had for five weeks been growing rapidly and was now producing severe respiratory obstruction. There was a hard, nodular swelling involving both lobes of the thyroid, with several hard glands adjacent to it. It was fixed to the trachea and attached to the skin. It was regarded by myself and by Mr. Hayward Pinch as a typical carcinoma of the thyroid. It grew so rapidly that in ten days the circumference of the neck had increased by $1\frac{1}{2}$ inches. Twenty radon seeds, each containing 1·5 millicuries of radon, were inserted through two small punctures, one on each side of the trachea, and were distributed as far as possible throughout the tumour. In ten days the tumour had completely vanished, and although the neck was very thin, the thyroid gland could no longer be felt. The circumference of the neck had diminished by three inches, and all symptoms of obstruction had disappeared. She remains in perfect health.

Carcinoma of the Œsophagus. (Fig. 6.)

A man aged 72 had suffered from increasing difficulty in swallowing for three months, and he could now only swallow sips of water with great difficulty. A tall, powerfully-built man, he had lost three stone in weight and he was so weak that

he could scarcely stand. An X-ray film showed that the œsophagus was obstructed by a malignant growth ten inches from the teeth. On œsophagoscopy a large ulcerated mass of growth was seen encircling the œsophagus, bulging prominently inwards on the left side. Into the substance of the growth eight radon seeds were inserted, each containing 1·5 millicuries. In twenty-four hours there was a distinct improvement in swallowing, which may, however, have been due to the passage of a bougie at the operation. In a week he was taking ordinary soft foods and was obviously gaining weight and strength. In four weeks he was taking ordinary full diet, with the sole precaution that he should eat slowly. In six weeks he had gained nearly two stone in weight and appeared to be in perfect health.

Carcinoma of the Stomach. (Fig. 7.)

A man aged 53 had complained for three months of epigastric pain increased by food, of loss of appetite, and of loss of weight, which he estimated at two stone. On exploration a firm, smooth, œdematous tumour of greyish colour was found involving the lesser curvature and extending upwards almost to the cardiac orifice. It was regarded as a carcinoma of a rapidly growing type, and it was obviously quite inoperable. There were, however, no enlarged glands. Into the substance of the tumour were inserted six platinum needles, each 4 centimetres long and containing 4 milligrammes of radium element. They were so arranged as to radiate from a centre on the anterior surface of the stomach, and the threads collected here were buried in an invagination of the anterior wall of the stomach, formed as for a Witzel's gastrostomy. The threads were brought out in a bunch through the laparotomy opening, which was then closed. Five days later the needles were withdrawn without difficulty. The patient made a normal recovery, his pain ceased, his appetite returned, and in three months he had regained his normal weight and was the picture of health.

Angioma of the Meninges. (Figs. 8, *a*, *b*.)

A man aged 45 had suffered for years from fits at long intervals. Recently the fits had become more frequent and severe, and they were now accompanied by loss of consciousness. They were Jacksonian in type, commencing in the left hand and spreading to the face and leg. Beyond a slight increase in the deep reflexes on the left side, there was little to be made

out on a neurological examination. On exposing the right Rolandic area by means of an osteoplastic flap formed with my craniotome, and on opening the dura, a mass of huge interlacing veins was found occupying the whole of the upper portion of the field and forming a vascular tumour about three inches in diameter. As no direct treatment seemed practicable, the dura was closed and on to its outer surface were sutured six radium needles, each 2 centimetres long and containing 2 milligrammes of element. The needles were arranged as the spokes of a wheel, and the attached threads were brought out through the central hole in the bone flap. The bone was replaced, the threads brought through the scalp flap, and the scalp was sutured into position.

The after history of the case was somewhat remarkable. Three days later he noticed a weakness of the left arm, which developed next day into a complete paralysis. On the following day the needles were drawn out by threads without difficulty, having been in position for five days. A week later he had completely recovered the use of the arm. There has been no recurrence of the fits, and he seems to be in perfect health.

These cases show the effects which radium can produce in a great variety of situations. They show how wide are its powers, and they suggest that where we have failed it is rather our method of application than radium itself which is at fault. They suggest to me that a new field of surgery is opening up before us, the limits of which it is impossible to foresee.

THE DISTAL PHENOMENA THAT ACCOMPANY HIGH ARTERIAL TENSION.*

BY

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No one who studies the diseases of the cardio-vascular system can fail to note the diversity of the cerebral symptoms that may accompany high arterial tension.

Looking back through case-notes of patients with high blood pressure, I was struck afresh by this diversity and at the same time by the parallelism between these cerebral phenomena and those seen in other organs in the presence of high tension. These parallelisms are set forth in the following table :—

Distal Phenomena Associated with High Blood Pressure.

ACUTE, WITH RAPID RECOVERY.	ACUTE, WITH PARTIAL OR NO RECOVERY.	PROGRESSIVE.
	Brain.	
Recurrent aphasia, hemiplegia, etc.	Thrombosis, softening (hemorrhage).	Dementia, paresis (of type described).
	Heart.	
"Ischæmia cordis," or angina of effort.	Coronary thrombosis, or cardiac infarction.	Myofibrosis cordis or cardiosclerosis.
	Limb.	
Intermittent claudication.	Gangrene.	Gangrene.
	Bowel.	
(Case recorded.)	Mesenteric thrombosis.	?

* A Paper read to the Bath and Bristol Branch of the British Medical Association on 31st October, 1928.

These distal effects of high pressure are of great interest, for example, in relation to the muscular functions of the wall of the heart and of the lower limb. The analogies between these two have been stressed for over a century, even to the point of labelling the one set of phenomena "angina cruris," so as to bring them into line with those of "angina pectoris." But it is only in recent years that recognition of the symptoms of cardiac infarction has rehabilitated the coronary hypothesis of angina, and in so doing has thrown a new light on the meaning of the anginal attack, whether in the leg or in the heart. It has thus become clear that persons with high arterial tension are subject to two kinds of interference with muscular function, whether in the wall of the heart or in the calf of the leg: a transient kind of attack, in which pain is the prominent symptom; and a more lasting affair, which involves permanent injury of the parts affected. So far as the heart is concerned we are able, and indeed constrained, to add a third category, that of the slowly progressive degradation of muscle function, that is all the more striking because it is imposed on a cardiac wall from which the high pressure is exacting a supernormal effort.

Now, if we examine the objective cerebral phenomena that accompany high blood pressure, we shall also find the same three groups. The interference with function may be abrupt or it may be gradual; and if it is abrupt it may pass off leaving the patient none the worse, or it may inflict on him a permanent injury.

Examples of this kind are familiar enough, and the text-book descriptions are explicit. We need not stop

to discuss these except to remark that it is doubtful whether it is so easy to make a diagnosis between hemorrhage and thrombosis as we have been led to believe. It seems to me that it is almost as unsafe to exclude a diagnosis of hemorrhage because the blood pressure has been low as it is to exclude a diagnosis of thrombosis because the pressure has been high. Probably few would cavil at the suggestion that a stroke in which the patient is not deprived of consciousness is more likely to be due to blocking than to bursting of an artery; and there is a turn of opinion towards accepting a similar explanation of most strokes. Dr. James Collier[1] says we should regard as thrombotic most strokes that are survived for ten days after the onset. There is, of course, an irreducible group of strokes of which hemorrhage is the only explanation, and moreover there are plenty of sites—the retina, the mucous membranes, and so on—where hemorrhages do occur in persons with high blood pressure. Yet there is also in the hyperpietic a thrombotic type of stroke, leading to necrosis of the parts deprived of their blood, just as a similar process may in the leg end in gangrene and in the heart wall in infarction.

Such phenomena as these are not difficult to understand. But what are we to say of the attacks that come and go, leaving no permanent organic results as far as can be seen?

Take, for example, the case of a friend of mine, with high arterial tension; a man accustomed to work to the limit of his strength and beyond it, till at length he was seriously disturbed to find himself unable to walk briskly, even on the level, without provoking oppressive pain under the sternum.

This went on for months, till he consented to a restriction of his undertakings, some years ago, and I do not believe he ever gets the pain now; nor has he developed any other evidence of cardiac disease. Yet I have no doubt that the pain was cardiac.

The cerebral counterpart of this, recurrent paresis, has been described by many physicians. A brief note of the first case I saw, twenty-five years ago, may suffice as an illustration.

A man of sixty was admitted to St. Mary's Hospital unconscious, and in a right-sided convulsion. Seen two days later, he showed weakness in his right arm, a little in his right leg, a tendency to recurrent utterance, and some lingering confusion of mind. In an attack two years earlier he had been admitted in much the same state, and a few weeks later he came in again at the end of an attack.

More often there is a hemiplegia, for all the world like the usual capsular lesion, except that it is transient. Sometimes it is an aphasic and sometimes a hemianopic syndrome that recurs. Sometimes the series is closed by an attack that inflicts permanent damage, but in many instances the attacks return over a period of years and no final breakdown occurs. In 1909 Dr. George Parker, writing in our *Journal*,[2] described these cases, and felt himself unable to support the view still held by many physicians that an arterial spasm is responsible. This conclusion of Dr. Parker's Clifford Allbutt quoted with approval in his book on *Diseases of the Arteries*.[3]

It would be easy to allow this fascinating branch of our subject to divert us from the main thesis, but if we are to get a general view of these distal phenomena we must also scrutinize other parts of the circulation. There is no better example of these

transient interferences with function than intermittent limp.

An instance of this is furnished by a hospital patient, a man aged 60 with a high arterial tension, who was already subject to the angina of effort, when he began to notice pain in the right calf coming on after he had walked 300 yards and rendering further progress impossible. The systolic blood pressure in one arm is 240 and in the other 185. In the legs it is 180 to 190. Drs. Beatson and Hooker found that exertion made no difference to the blood pressure in either arm, while amyl nitrite brought both down by one-third.

There are, then, in persons with high arterial tension, interferences with function, alike in their course, whether brain, heart or limb be involved; abrupt in onset, brief in duration, leaving no trace of permanent injury.

Next we have briefly to discuss certain steadily progressive degradations of function that are also found in hyperpietics. The issue is confused in the cardiac branch of this subject; for who is to judge how much of the myocardial failure, that so often closes the career of the hyperpietic, should be ascribed to the excessive demand laid on the cardiac muscle by the high pressure, and how much to failure of the coronary function? How much of the failure is proximal, and how much distal? In the limb I do not think we often see progressive decrease of ability in the type of arterial disease that we are discussing, short of senile gangrene, which develops slowly in some instances. It is in the brain that we can most clearly discern the gradual type of failure. The kind of thing I am thinking of may best be illustrated by a brief note of one of the half-dozen examples that

have come under my observation. For these the term "hypertensive encephalopathy," used by Oppenheimer and Fishberg,[4] seems appropriate.

A man aged 59 had a fit four years ago, and was found to have retinal changes; yet a year later he was well enough to get a good prognosis from a careful physician. Soon after this a renal epistaxis occurred. Recently he has developed an unsteady gait, emotionalism, a tendency to repeat himself in speech, and uncertain control of his anal sphincter. His arteries are thick and hard, his blood pressure 220/140, his aortic second sound loud. An aortic diastolic murmur is heard at the lower end of the sternum. He has a shuffling, unsteady gait, without true ataxia: his deep reflexes are increased, and the plantar response on the left side is extensor. The retinal vessels are blurred in one or two spots by patches of exudate. The pupils, though small, react naturally. He is childish and emotional, but not boastful; and although his speech is slurred, there is no tremor of lips or tongue. The urine is of a low specific gravity and contains albumin. There is good reason to believe that he was never infected with syphilis.

This is a fair sample of the progressive degeneration of the brain that may be seen in chronic hyperpiesis. It is true that it fades off into the syndrome of sudden catastrophe.

A good example of this is seen in the case of a man aged 50 who two years earlier had had a stroke without loss of consciousness, which deprived him of power in his left side. From this he recovered, though it left him clumsy on that side. Some months after this he got another attack implicating his speech and paralysing his right side, from which he made no recovery. Mental deterioration set in, though he seemed worse in this respect than he was actually, because his emotional expression was disproportionately affected, and he laughed and cried on the least provocation. He showed a spastic state and could scarcely stand. His cerebro-spinal fluid was normal, and his blood pressure was 200/120.

There can be little doubt that these phenomena,

whether gradual or abrupt in their onset, whether temporary or permanent in their results, are directly related to the high arterial tension that is so striking a feature of the clinical background. Yet there are many reasons for believing that the relation is not direct, but mediated by arterial degeneration. In the first place, their liability to occur is by no means directly proportional to the height of the blood pressure. On a recent out-patient day the first two patients seen each of them had systolic pressures of over 300, yet no distal phenomena at all if we except the coronary factor in the total arrhythmia which one of them displayed; while, on the other hand, the third patient was the man of whose claudication I have already spoken, his systolic pressure being round about 200 mm. Hg. Indeed, one may observe all these phenomena—intermittent limp, recurrent paresis, cardiac pain—in persons with normal or even low pressures, provided they have the necessary arterial decay. Perhaps one may ascribe to the hyperpietic syndromes a rather more progressive nature than that of pure atheromatous degeneration. Otherwise there is no obvious difference. It seems clear, therefore, that it is not the high pressure so much as the arterial wear and tear that the pressure has exacted that is responsible for these distal phenomena.

The first proposition, then, that I will ask you to accept is that high arterial tension brings about these distal phenomena in so far as it brings about degeneration of the arterial walls.

We may now turn to discussion of those transient phenomena which, whether they occur in brain, heart

or limb, it has been customary to ascribe to arterial spasm.

Let us glance first at some of the clinical evidence. First, then, we note that in the subject of intermittent limp the affected member shows signs of a temporary anæmia. In addition to the lack of arterial pulse, which is usually present between attacks, the skin becomes cold and the limb white. The loss of power and abnormal sensations which go to make up the attack are almost certainly the direct outcome of this failure of the blood to flow into the limb. Secondly, the access of cardiac pain that comes with exertion may be considered. The view that the site of anginal pain lay somewhere in the cardiac wall, and had some relation to its coronary blood supply, has been reinstated by the observations that many of us have been able to contribute as to the association of this kind of pain with coronary infarction. We may therefore go as far as to assert that anginal pain arises in the cardiac wall, and—in all probability—in the muscular tissues. Analysis of a series of case notes showed me that cardiac pain of the ischæmic type, *i.e.* substernal pain coming on during exertion and relieved by its cessation—was complained of in 29 per cent. of the senile cases, 16 per cent. of the hyperpietics, and no less than 43 per cent. of those with cardiac syphilis. For the moment we need go no further than to note that it is precisely in these groups that we encounter aortic and coronary lesions. In syphilis the coronary openings are often so narrow as to be difficult to find, and in the arteriosclerosis of age and of hyperpiesia some degree of change is found either in the suprasigmoid part of the aorta or in the course

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In the case of cerebral attacks we can bring to bear less direct evidence to show what happens; but again analogy, on the one hand with intermittent limp and angina, and on the other with the thrombotic hemiplegias that only differ from the transient attacks in their duration, seems to justify us in a belief that arterial disease causes them by delaying the flow of blood into a localized area of brain. There is also experimental evidence in support of this view, to which I have no time to refer.

All things considered, I believe we are on safe ground in ascribing these temporary failures of function, whether in brain, heart or limb, to a temporary and localized failure of arterial function.

It is customary to think of this arterial failure only in terms of obstruction; and when actual inspection of arteries, as well as the transitory nature or the phenomena, has proved that in many instances there can have been no organic obstruction, to invoke a hypothetical spasm. It seems to me that we are here still under the dominion of the old mechanical view of the circulation, from which we have been rescued so far as the heart and its work are concerned. That it is a mistake to think of obstruction, whether temporary or permanent, as essential to the provocation of these distal syndromes is suggested by the following scraps of evidence.

In a paper on[5] coronary thrombosis which I read to this Branch a year ago I remarked that in only about

one quarter of my cases had there been a long history of attacks of cardiac pain ante-dating that which ushered in and declared the occurrence of infarction in the wall of the heart. The obverse of this is also true. We have all of us seen many patients who have suffered from transient attacks of cardiac pain for years without developing anything more serious. This is hardly what we should expect if the anginal attack were symptomatic of partial, and the thrombotic attack of complete, coronary obstruction. The two would appear more often than they do, I think, as consecutive phases of the same process.

A more direct kind of evidence is afforded by one or two anatomical observations. One of the most striking and suggestive of these was furnished by my surgical colleagues.

Mr. Tasker had asked me to see with him an elderly man, who had for some years been known to suffer from intermittent limp, as well as transient bouts of giddiness. He had a raised tension and tough, deformed arteries. Our immediate concern was how to deal with symptoms of acute intestinal obstruction. I felt that these were possibly due to a mesenteric thrombosis, but thought it wrong to deny him the possibility of surgical relief in case some other cause of obstruction were actually found. Mr. Tasker and Mr. Clifford Moore therefore opened the abdomen and found numerous blackish-blue patches of thickening in the wall of the small bowel, almost exactly like the condition of the herniated bowel in advanced strangulation. The abdominal aorta was enormously dilated in its upper portion, from the diaphragm to just below the renal vessels. His abdomen was closed immediately, and we kept him under the influence of morphia for four or five days. At the end of that time, to our surprise, he had left behind him his abdominal symptoms. Our delight was short-lived, for the next few days saw other arterial catastrophes, ending in a cardiac death which was doubtless due to coronary thrombosis. Yet he gave us the clearest proof that an attack of what one can only call infarction of the bowel, almost certainly arterial

in origin, can be recovered from. This must mean return of vitality in the damaged parts. If this had not occurred the obstruction would not have passed off and the peritoneum must have become infected.

Even more convincing, perhaps, was the experience that we had recently at the Bristol General Hospital.

A man aged 59, with chronic hyperpiesis of renal origin, died a sudden cardiac death, and was found post-mortem to have a large area of necrosis in the wall of his left ventricle and the septum ventriculorum. In one other case of the kind Dr. Perry's injections of the coronary arteries proved that blood did not enter the necrotic area. In this case, however, we dissected out the arteries entering into the necrotic area, and examined them most carefully, but without discovering any trace of clot or other obstruction to the arterial lumen.

The brain lesions of arterial disease tell a similar story. Being interested in the "hypertensive encephalopathy" alluded to above, not only for its own sake but also because of its possible bearing on this question of the relation of arterial failure to phenomena of organic malnutrition, I asked Dr. Macdonald Critchley, who has been at work on such matters, to give me some information. He referred me to a paper by Foix, Hillemand and Ley,[6] who state that in a series of 56 cases of cerebral softening the arterial obliteration was complete in 12, subtotal in 14, while in 30—or more than half—there remained a lumen of some dimensions.

What can all these observations mean but that quite serious interruptions to the life of a localized area of tissue may be associated with arterial disease, yet without blockage of the artery concerned? At all events, they provoke us to ask whether there is no other arterial function beside that of maintaining an open channel, the failure of which might seriously

reduce the blood-flow into the part supplied. Arterial degeneration, whether induced by the over-stress of long-continued hyperpiesis, or more stealthily by the advance of age, is attended by a loss of that elasticity which is one of the chief functions of the arterial tree. For the moment I am not thinking of the muscular elements in the arterial wall so much as of the elastic tissue — a tissue which probably cannot be hypertrophied nor its losses made good by regeneration. The resilience of this element in the walls of the main arteries constitutes the second great propulsive force of the circulation. The arterial tree takes up the blood passed to it by the contracting ventricle, and by its elastic rebound forwards a steady stream of it to the periphery. We are familiar with the belief that loss of this force has, on its proximal side, a deleterious effect on the work of the circulatory pump which, by increasing the cardiac task, calls forth a ventricular hypertrophy. Can it be doubted that on the distal side also there must be effects of arterial failure—loss of efficiency in the local provision of blood, depression of function consequent on that loss, and symptoms indicative of imperfect function ?

Let us test this hypothesis by applying it to the distal syndrome about which we know most—that of the angina of effort, ischæmia cordis, the attack of constricting pain felt behind the sternum during effort and relieved when that effort ceases. It has already been remarked that the three common causes of this syndrome are syphilis of the heart and aorta, cardio-arterial degeneration induced by chronic hyperpiesis, and the cardio-vascular lesions of age. Now, all these three sets of lesions fall with particular

severity on that part of the circulatory apparatus which is responsible for the nutrition of the cardiac muscle ; the first part of the thoracic aorta, the aortic semilunar valves, and the coronary arteries. Recent work by Anrep and his associates[7] seems to show that the coronary arteries are filled during ventricular diastole. When the ventricular wall is tightly compressed in systole the coronary arteries share in this compression, so that no blood can enter them. But when the ventricle relaxes in diastole the coronary vessels are open to receive blood from the aorta ; and it is the elastic recoil of the aorta, rendered effective by the closure of the aortic semilunar valves, that fills them. When this elastic recoil is ineffective, even if the coronary vessels be pervious and the aortic valves competent, coronary filling must be inadequate, and particularly when the demands of exertion for an increased coronary flow have to be met, and if the coronary vessels themselves are rigid and inelastic, this inadequacy will become intolerably great. If we view this apparatus—the first part of the aorta with its semilunar valves and its coronary branches —as an organic unit concerned with ensuring a steady supply of blood to the walls of the heart, we shall understand better the frequency with which this apparatus is damaged as a whole by chronic cardiovascular degeneration, and the deadly nature of that damage.

Let me, then, sum up briefly by saying that the distal phenomena of high arterial tension can all of them be ascribed in part to a gradual wearing down of the elasticity of the arterial tree : in a brief phrase, to progressive arterial failure.

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[7] *Heart*, 1927, xiv. 111.

PLATE I.

FIG. I.
Healthy uretero-pyelograms.

THE ROLE OF PYELOGRAPHY IN RENAL DISORDERS.*

BY

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As the race grows older it provides, with each generation, a crop of zealous workers concerned with cutting new and better paths to the summit of civilization. Sage elders, however, turn the pages of history and remark that most of our innovations are but rediscoveries. Despite this warning to the young enthusiast, I venture to suggest that in pyelography and the concomitant segregation of the urines of the kidneys, the diagnostic guesswork of the last century has been replaced by an almost exact science. It is an inestimable boon that it is possible, by means of the ingenious and delicate instruments recently invented, to peer into the complex recesses of a deep-seated organ like the kidney and, metaphorically, take test-tubes and culture media there as well as vision. This technique is all the more satisfactory in that, when the investigation is finished, the kidney is none the worse for the manipulations. It gives exact information of the hidden strongholds of a deeply-entrenched foe. The light of the science of to-day has triumphed over the darkness of the upper

* A Paper read at a Meeting of the Bristol Medico-Chirurgical Society held at the University of Bristol on 9th January, 1929.

urinary tract, even as the cystoscope first illumined the bladder in the last century. This has led to a revolution in urinary diagnosis which it is my purpose to portray.

Pyelography and allied processes may be regarded as equivalent to an exploration of the kidney by the closed method, justifying the title of "bloodless nephrotomy." It will appeal more to the medical practitioner, for whom diagnosis is of primary importance in treating disease, than to a suffering public whose only interest lies in the cure of their malady. On increasingly accurate diagnosis depends progress in the treatment of disease.

TECHNIQUE.

Preparation.—Accurate diagnosis of a pyelogram often depends on fine distinctions. As shadows of bowel wall and contents, falling across the renal region, may confuse and distort the pictures, it is imperative to prepare the patient in this respect.

Anæsthetic.—A preliminary sedative, local urethral anæsthesia and a conscious patient are preferable to a general anæsthetic. For the beginner they are essential. The reason is that the best guide to good filling of the kidney is when the patient notices a warning discomfort in the side. It is thanks to this guide, also, that the danger of over-distention is prevented.

Examination.—The bladder cavity is inspected and abnormalities noted. Prior to threading the ureters with special long and slender catheters, their orifices and the character of the effluxes issuing from them are patiently observed. The catheter is then passed through a tunnel in the cystoscope till the operator sees the end

projecting at the vesical eye of the cystoscope. A tribute needs to be paid to Albarran who invented the lever that next directs the end of the catheter into the ureter. The ureteric catheter is then passed up the duct. The ideal destination for it is when its tip is near the bottom or outlet of the renal cavity. Both kidneys are dealt with as a rule and with the double catheterizing cystoscope. Having introduced the catheters, and being satisfied they are working well, the surgeon may withdraw the cystoscope and relieve the patient of this discomfort. As a routine, however, I doubt the wisdom of, and do not do, this, as the catheters inevitably withdraw a certain distance and essential evidence may be lost. Preparation is made for radiography at this stage.

Radiography.—The need for careful placing of the patient so that kidney and X-ray plate correspond is apt to be forgotten. A plain X-ray of the whole tract antero-posteriorly, and laterally when necessary, is taken. Immediate development of these is helpful in revealing, by the level of the catheter tips, abnormally high or low kidneys. Without this knowledge the radiologist could not make the necessary adjustment in the position of his plate. Failure to recognize this possible error and guard against it has often rendered pyelography worthless. Then each kidney in turn is pyelographed as follows: Warmed opaque solution is run in, either by gravity (the best method for beginners) or from a syringe. The renal intake varies, the average being 5–8 c.c., but I have met with such extremes as 3–15 c.c. respectively in health. This makes it very difficult to foretell what is the approximate quantity for any patient. As soon as pain is felt or the average

amount has entered the kidney, the patient is instructed to hold his breath and keep quite still. The radiogram is taken at once and developed, as it may have to be repeated. The opaque medium is then withdrawn. Ensuing lavage is of doubtful merit. The catheter and cystoscope are now removed. If delayed emptying from pyeloureteric obstruction is suspected, then the catheter is withdrawn without the preliminary aspiration of the fluid, which is left for the kidney to expel. The time this takes is revealed by a series of pyelograms taken at intervals until the shadow has faded.

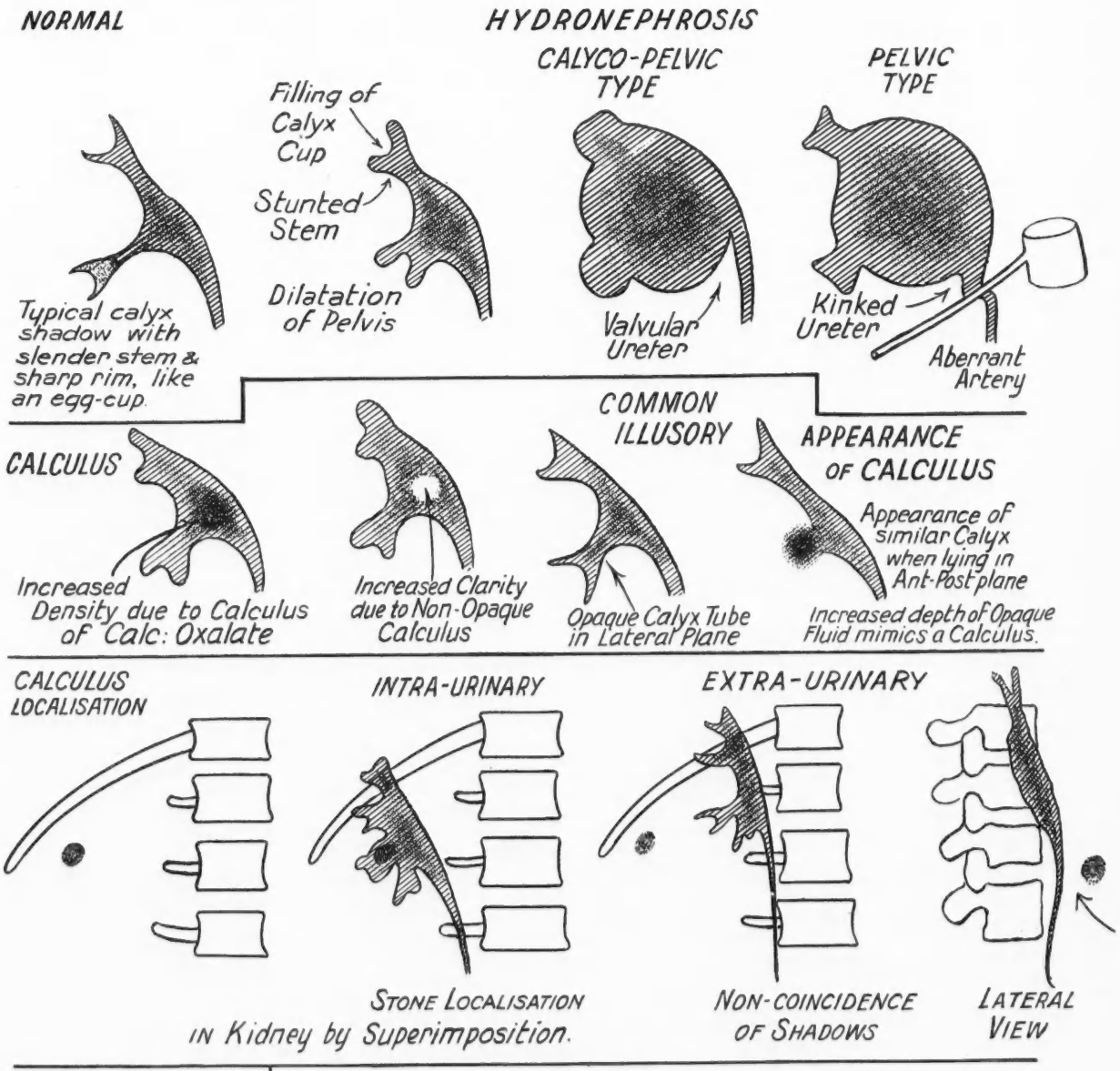
After-care and Complications.—The patient is immediately provided with hot bottles, morphia (s.o.s.) and copious drinks. Pain varies from a negligible degree to genuine renal colic. It may last three or four days. Vomiting occurs occasionally, and the patient sometimes suffers from shock. Hæmaturia, microscopic or slightly visible, is common; in a few cases it is considerable.

THE SCOPE OF PYELOGRAPHY.

A preliminary analysis of the evidence the picture affords may facilitate diagnosis of actual cases. (See chart.)

The Normal Pyelogram.—This tells us the number, site and shape of the kidneys and ureters (see Fig. 1). It reveals the negative evidence of the presence of a healthy kidney, which is information of priceless value in the differentiation of obscure abdominal pains and swellings. All the more precious is such information since, in a general search of the peritoneal cavity at abdominal exploration, the kidney is not open to easy examination. Mere palpation may leave one

PYELOGRAPHIC CHART



ignorant of early infectious or neoplastic disorders. Further, the sure knowledge of one healthy organ which it affords gives the surgeon complete confidence in dealing with the fellow-kidney when diseased. There is a natural difficulty in reading healthy pyelograms, for, although externally kidneys maintain their well-known form, their interior cavities are as protean in form as are men's faces. This makes detection of early disorders of structure only possible after much experience in the reading of the radiograms. Added to this natural variation there is the still further surprise that the two healthy kidneys of the same patient are asymmetrical and often grossly different. No wonder the question is often asked, " What is a normal pyelogram ? "

In the range of normal pyelography great variety of form must be expected, just as in the features of healthy faces. Ill-health is deduced from altered expression rather than from the form of the face. As in faces, so it is in kidneys. Thus, in the diagnosis of early hydronephrosis the observer pays more attention to a bloated expression in the pyelogram and rather disregards the directions and number of the calyces.

It is worth repeating that for pyelography to establish, with scientific certainty, that the kidneys are present and normal, is one of the most valuable and common services it renders.

Abnormalities.—Among the abnormalities it depicts, some of which are shown in the chart, are :—

A.—Congenital—solitary, fused, ectopic and polycystic types.

B.—Acquired—(*a*) Hydronephrosis, general and local, primary (due to kinked outlet or non-dependent

drainage), or secondary (due to calculi, tumours, etc.). (*b*) Irregularity and roughening of the pelvis. (*c*) Filling defects, "bays," etc., of the pelvic walls. (*d*) Calculi—defining the exact nature and site. Such pictorial abnormalities have their correlation in disease.

ILLUSTRATIVE CASES.

My next step is to illustrate how pyelography has helped in the elucidation of the underlying disorders which caused the clinical symptoms of my cases, and so laid the sure foundation for sound treatment. Cases come with clinical labels ; but these are crude categories, and we have to diagnose accurately by information obtained from all corners of the urinary system.

This article is based on a total of 129 cases, of which 111 were hospital cases and 18 private cases. Of these 53 were males, 71 females, and 5 children. The age limits were from 4 to 77 years. I have divided the cases into clinical groups according to the patient's dominant symptom. Naturally some of the groups overlap, inasmuch as some come into two groups, *e.g.* renal colic and hæmaturia. The figures shown belong to illustrative cases taken from the seven main groups which are as follows :—

I. Renal colic—30 cases.
II. Hæmaturia—17 cases.
III. Dysuria—24 cases.
IV. Fistula—3 cases.
V. Abdominal aches and pains—43 cases.
VI. Swellings in the hypochondrium—10 cases.
VII. Calculus—16 cases.

PLATE II.

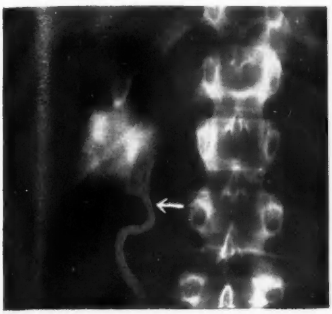


FIG. 2.—*Hydronephrosis (right).*

FIG. 3.—*Hydronephrosis (right).*

FIG. 4.—*Hemi-hydronephrosis (right).*

FIG. 5.—*Hydronephrosis (left).*

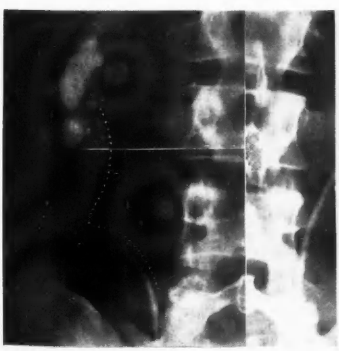


FIG. 6.—*Ureteric obstruction (right). Due to acute kink.*

FIG. 7.—*Hydronephrosis (right).*

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or limb, it has been customary to ascribe to arterial spasm.

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[6] *Bull. et MS. des Hôp. d. Paris*, 1927, xliii. 189.

[7] *Heart*, 1927, xiv. 111.

PLATE I.

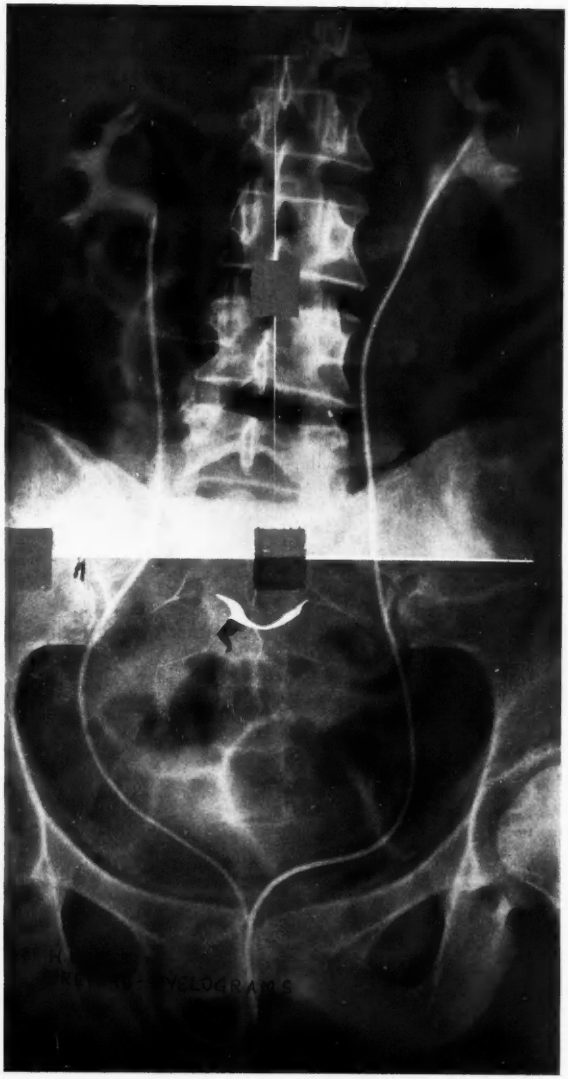

FIG. 1.
Healthy uretero-pyelograms.

THE ROLE OF PYELOGRAPHY IN RENAL DISORDERS.*

BY

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As the race grows older it provides, with each generation, a crop of zealous workers concerned with cutting new and better paths to the summit of civilization. Sage elders, however, turn the pages of history and remark that most of our innovations are but rediscoveries. Despite this warning to the young enthusiast, I venture to suggest that in pyelography and the concomitant segregation of the urines of the kidneys, the diagnostic guesswork of the last century has been replaced by an almost exact science. It is an inestimable boon that it is possible, by means of the ingenious and delicate instruments recently invented, to peer into the complex recesses of a deep-seated organ like the kidney and, metaphorically, take test-tubes and culture media there as well as vision. This technique is all the more satisfactory in that, when the investigation is finished, the kidney is none the worse for the manipulations. It gives exact information of the hidden strongholds of a deeply-entrenched foe. The light of the science of to-day has triumphed over the darkness of the upper

* A Paper read at a Meeting of the Bristol Medico-Chirurgical Society held at the University of Bristol on 9th January, 1929.

urinary tract, even as the cystoscope first illumined the bladder in the last century. This has led to a revolution in urinary diagnosis which it is my purpose to portray.

Pyelography and allied processes may be regarded as equivalent to an exploration of the kidney by the closed method, justifying the title of "bloodless nephrotomy." It will appeal more to the medical practitioner, for whom diagnosis is of primary importance in treating disease, than to a suffering public whose only interest lies in the cure of their malady. On increasingly accurate diagnosis depends progress in the treatment of disease.

TECHNIQUE.

Preparation.—Accurate diagnosis of a pyelogram often depends on fine distinctions. As shadows of bowel wall and contents, falling across the renal region, may confuse and distort the pictures, it is imperative to prepare the patient in this respect.

Anæsthetic.—A preliminary sedative, local urethral anæsthesia and a conscious patient are preferable to a general anæsthetic. For the beginner they are essential. The reason is that the best guide to good filling of the kidney is when the patient notices a warning discomfort in the side. It is thanks to this guide, also, that the danger of over-distention is prevented.

Examination.—The bladder cavity is inspected and abnormalities noted. Prior to threading the ureters with special long and slender catheters, their orifices and the character of the effluxes issuing from them are patiently observed. The catheter is then passed through a tunnel in the cystoscope till the operator sees the end

projecting at the vesical eye of the cystoscope. A tribute needs to be paid to Albarran who invented the lever that next directs the end of the catheter into the ureter. The ureteric catheter is then passed up the duct. The ideal destination for it is when its tip is near the bottom or outlet of the renal cavity. Both kidneys are dealt with as a rule and with the double catheterizing cystoscope. Having introduced the catheters, and being satisfied they are working well, the surgeon may withdraw the cystoscope and relieve the patient of this discomfort. As a routine, however, I doubt the wisdom of, and do not do, this, as the catheters inevitably withdraw a certain distance and essential evidence may be lost. Preparation is made for radiography at this stage.

Radiography.—The need for careful placing of the patient so that kidney and X-ray plate correspond is apt to be forgotten. A plain X-ray of the whole tract antero-posteriorly, and laterally when necessary, is taken. Immediate development of these is helpful in revealing, by the level of the catheter tips, abnormally high or low kidneys. Without this knowledge the radiologist could not make the necessary adjustment in the position of his plate. Failure to recognize this possible error and guard against it has often rendered pyelography worthless. Then each kidney in turn is pyelographed as follows: Warmed opaque solution is run in, either by gravity (the best method for beginners) or from a syringe. The renal intake varies, the average being 5–8 c.c., but I have met with such extremes as 3–15 c.c. respectively in health. This makes it very difficult to foretell what is the approximate quantity for any patient. As soon as pain is felt or the average

amount has entered the kidney, the patient is instructed to hold his breath and keep quite still. The radiogram is taken at once and developed, as it may have to be repeated. The opaque medium is then withdrawn. Ensuing lavage is of doubtful merit. The catheter and cystoscope are now removed. If delayed emptying from pyeloureteric obstruction is suspected, then the catheter is withdrawn without the preliminary aspiration of the fluid, which is left for the kidney to expel. The time this takes is revealed by a series of pyelograms taken at intervals until the shadow has faded.

After-care and Complications.—The patient is immediately provided with hot bottles, morphia (s.o.s.) and copious drinks. Pain varies from a negligible degree to genuine renal colic. It may last three or four days. Vomiting occurs occasionally, and the patient sometimes suffers from shock. Hæmaturia, microscopic or slightly visible, is common; in a few cases it is considerable.

THE SCOPE OF PYELOGRAPHY.

A preliminary analysis of the evidence the picture affords may facilitate diagnosis of actual cases. (See chart.)

The Normal Pyelogram.—This tells us the number, site and shape of the kidneys and ureters (see Fig. 1). It reveals the negative evidence of the presence of a healthy kidney, which is information of priceless value in the differentiation of obscure abdominal pains and swellings. All the more precious is such information since, in a general search of the peritoneal cavity at abdominal exploration, the kidney is not open to easy examination. Mere palpation may leave one

ignorant of early infectious or neoplastic disorders. Further, the sure knowledge of one healthy organ which it affords gives the surgeon complete confidence in dealing with the fellow-kidney when diseased. There is a natural difficulty in reading healthy pyelograms, for, although externally kidneys maintain their well-known form, their interior cavities are as protean in form as are men's faces. This makes detection of early disorders of structure only possible after much experience in the reading of the radiograms. Added to this natural variation there is the still further surprise that the two healthy kidneys of the same patient are asymmetrical and often grossly different. No wonder the question is often asked, " What is a normal pyelogram ? "

In the range of normal pyelography great variety of form must be expected, just as in the features of healthy faces. Ill-health is deduced from altered expression rather than from the form of the face. As in faces, so it is in kidneys. Thus, in the diagnosis of early hydronephrosis the observer pays more attention to a bloated expression in the pyelogram and rather disregards the directions and number of the calyces.

It is worth repeating that for pyelography to establish, with scientific certainty, that the kidneys are present and normal, is one of the most valuable and common services it renders.

Abnormalities.—Among the abnormalities it depicts, some of which are shown in the chart, are :—

A.—Congenital—solitary, fused, ectopic and polycystic types.

B.—Acquired—(*a*) Hydronephrosis, general and local, primary (due to kinked outlet or non-dependent

drainage), or secondary (due to calculi, tumours, etc.). (*b*) Irregularity and roughening of the pelvis. (*c*) Filling defects, "bays," etc., of the pelvic walls. (*d*) Calculi—defining the exact nature and site. Such pictorial abnormalities have their correlation in disease.

ILLUSTRATIVE CASES.

My next step is to illustrate how pyelography has helped in the elucidation of the underlying disorders which caused the clinical symptoms of my cases, and so laid the sure foundation for sound treatment. Cases come with clinical labels; but these are crude categories, and we have to diagnose accurately by information obtained from all corners of the urinary system.

This article is based on a total of 129 cases, of which 111 were hospital cases and 18 private cases. Of these 53 were males, 71 females, and 5 children. The age limits were from 4 to 77 years. I have divided the cases into clinical groups according to the patient's dominant symptom. Naturally some of the groups overlap, inasmuch as some come into two groups, *e.g.* renal colic and hæmaturia. The figures shown belong to illustrative cases taken from the seven main groups which are as follows:—

I. Renal colic—30 cases.
II. Hæmaturia—17 cases.
III. Dysuria—24 cases.
IV. Fistula—3 cases.
V. Abdominal aches and pains—43 cases.
VI. Swellings in the hypochondrium—10 cases.
VII. Calculus—16 cases.

PLATE II.

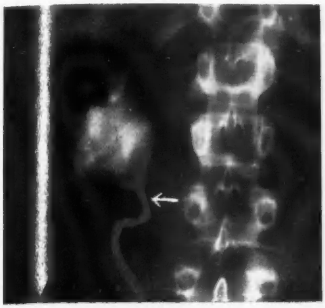


FIG. 2.—*Hydronephrosis (right).*

FIG. 3.—*Hydronephrosis (right).*

FIG. 4.—*Hemi-hydronephrosis (right).*

FIG. 5.—*Hydronephrosis (left).*

FIG. 6.—*Ureteric obstruction (right). Due to acute kink.*

FIG. 7.—*Hydronephrosis (right).*

PLATE III.

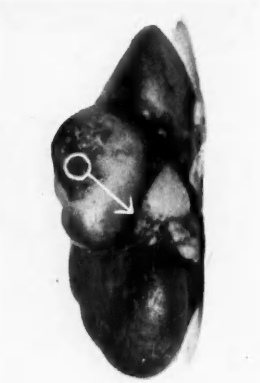
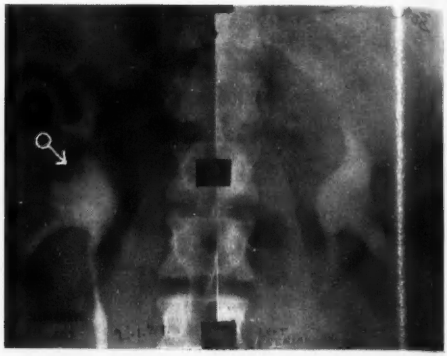


FIG. 8a.



Hypernephroma of right kidney. FIG. 8b.

FIG. 8c.—*Pyelogram of removed kidney showing relation of stunted calyces to tumour.*

FIG. 9.—*Hypernephroma (left).*

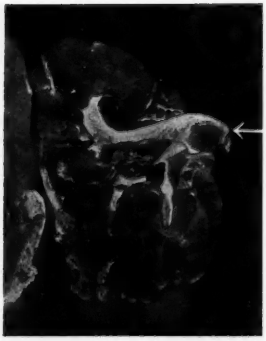


FIG. 10a.—*Tumour with pelvic growth in right kidney.*

FIG. 10b.—*Pyelogram of removed kidney with filling defect in pelvis.*

PLATE IV.

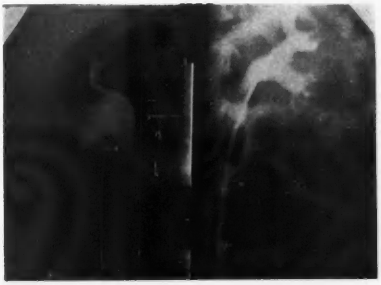


FIG. 11.—*Hydronephrosis (right).*

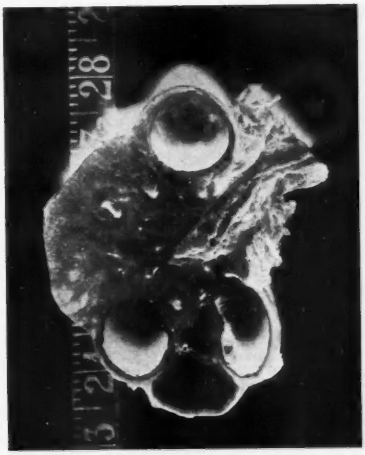


FIG. 12*b*.—*Right renal tuberculosis.*

FIG. 12*a*.—*Right pyonephrosis (tuberculous).*

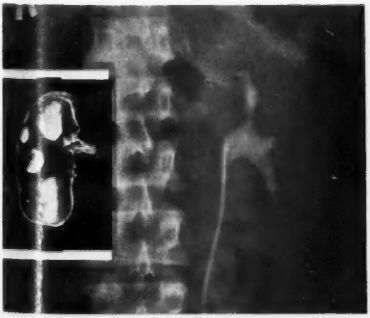


FIG. 13.—*Closed hydronephrosis (right). Normal pyelogram (left).*

FIG. 14.—*Blocked ureteric outlet (right) associated with renal fistula.*

FIG. 15.—*Horseshoe kidney.*

FIG. 16.—*Primitive tubular pelvis (left).*

FIG. 17.—*Bilateral polycystic disease.*

FIG. 18*a*.
Carbuncle invading upper half of kidney.

FIG. 18*b*.
Pyelograms of both kidneys in same case.

PLATE VI.

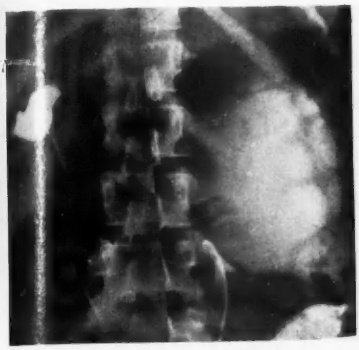


FIG. 19.—*Large pyonephrosis—ureter kinked.*

FIG. 20.—*Pyonephrosis—kinked ureter.*

FIG. 21.—*Perinephric abscess—deformed renal pelvis.*

FIG. 22.—*Healthy pyelogram of suspected kidney.*

PLATE VII.

Fig. 23.

Normal pyelogram—position of kidney in relation to overlying retroperitoneal tumour.

Class I.—Renal colic. Figs. 2–9.

Fig. 2. E. L.—Attack of renal colic and dysuria accompanied by pyrexia. Operation refused. Patient untraced. Pyelogram shows dilated pelvis, while kinked ureteric outlet suggests causal aberrant artery to lower pole of the kidney.

Fig. 3. A. C.—Symptoms and pyelograms similar to E. L. Causal aberrant artery found and divided at operation. Two years later reports cured.

Fig. 4. P. F.—Symptoms as E. L., but with hæmaturia. Comparison of pyelograms (bilateral) shows bi-partite pelvis, the lower half on the right side being dilated. Operation—pyelotomy and dilatation of the outlet. Reports cured.

Fig. 5. N. H.—Left renal colic. Pyelogram shows dropped kidney and typical pelvic type of hydronephrosis resulting. Pyeloplasty and nephropexy have cured.

Fig. 6. R. P.—Attacks of right renal colic for ten years and heavy hæmaturia. Ureteropyelogram shows a rare acute angulation of ureter. Operation declined.

Fig. 7. R. T.—Right renal colic. Pelvis dilated to 55 c.cs. Operation revealed causal aberrant artery to lower pole. Function of kidney justified conservative measures and obstruction was circumvented by lateral pyeloureteric anastomosis. Probably may yet need nephrectomy.

Figs. 8 (*a–c*). N. M.—Five weeks' history of severe renal colic (right), but only one slight hæmaturia. Right pyelogram shows " bay " filling defect and abortive calyces at arrow (see chart). Operation (2nd January, 1929) revealed early hypernephroma at position corresponding to pyelographic defect. Pyelography was repeated on the removed kidney for confirmation as seen in Fig. 8*c*.

Fig. 9. J. W.—Recent severe renal colic (bilateral) with hæmaturia. Pyelogram revealed " bay " filling defect. Operation (17th February, 1926) confirmed early hypernephroma at corresponding site in left kidney. Nephrectomy and insertion of radium. Recurrence in spring, 1928.

Class II.—Hæmaturia. Figs. 10, 11.

Figs. 10 (*a–b*). C. D.—Heavy hæmaturia with "clot" retention. This prevented preoperative pyelography. At operation kidney was removed containing growth with pelvic nodule. Opaque filling of specimen after removal shows area

of negative density at site of pelvic tumour. Dr. A. D. Fraser reports "hypernephroma," as with Figs. 8 and 9. Died five days later.

Fig. 11. P. S. (aged 4).—Heavy hæmaturia on two consecutive week-ends. Early dilation of pelvis of right kidney is seen by pyelography and excretion from right side was deficient. Aberrant vessel divided at operation.

Class III.—Dysuria. Figs. 12, 13.

Figs. 12 (*a–b*). M. S.—Frequent and painful micturition for a few months. Pyelography revealed cavernous ulceration of right kidney and unaltered left side. Specimen (Fig. 12*b*) was removed (October, 1928), despite presence of tuberculous organisms and pus in urine of both sides. She has done remarkably well.

Fig. 13. F. C.—Had cystitis with tubercle bacilli in urine in 1914, but recent trouble was partial incontinence of urine and right-sided pain. Right ureter was completely stenosed, preventing pyelography of that side, and no tubercle bacilli were found in the urine. Operation revealed closed hydronephrosis.

Class IV.—Fistula. Fig. 14.

Fig. 14. B. W.—Recurrent attacks of acute pyonephrosis with fistula in loin at site of two former nephrotomies. Right renal outlet blocked (? by stone, shown at catheter tip). Pyonephrectomy performed, as pyelogram of left kidney showed a healthy structure.

Class V.—Abdominal aches and pains. Figs. 1, 15–18.

Fig. 1. H. W.—Chronic loin ache proved non-renal by pyelography.

Fig. 15. C. F.—Pain in the right loin. Operation revealed horseshoe kidney as likely explanation of the convergence of the lower poles of pyelographic shadows.

Fig. 16. S. C.—Symptoms of left-sided pyelitis present. Primitive tubular state of pelvis found and anomalous structure confirmed in the removed kidney.

Fig. 17. M. H.—Admitted as suspected acute appendicitis of one day's duration. Operation revealed suppurative B. coli infection of cysts in enlarged right kidney. Pyelography shows irregularity of calyces, which are stumpy and of mushroom type.

PLATE VIII.

FIG. 24*a*.
Right hydronephrosis—suspicious presacral shadow.

FIG. 24*b*.
Ureterogram of mega-ureter.

FIG. 24*c*.
Serial ureterography—shows intraureteric calculus.

Figs. 18 (*a–b*). S. E.—Suffered right-sided pain for many months, variably diagnosed as pleurisy and pyelitis. Urine was sterile. Pyelography shows slight swelling of calyces suggesting early hydronephrosis. Kidney removed at operation had disorganized upper half riddled with necrotic nests of staphylococcal infection, *i.e.* carbuncle of kidney.

Class VI.—Swellings of the hypochondrium. Figs. 19–23.

Swellings of a dubious nature in the upper lateral abdomen form a distinct clinical group and afford frequent enigmas. For such a clinical conundrum the inclusive title of " hypochondrioma " is suggested. Figs. 19–23 are the pyelographic findings in five typical cases of this category.

Fig. 19. S. A.—The doctor called me to see this as a case of perforated gastric ulcer. It seemed that her trouble might be due to sudden complete blocking of a pyonephrosis, and pyelography clinched the diagnosis, for the ureter is seen kinked at the junction with the kidney. Nephrectomy has cured her.

Fig. 20. D. P.—Recurrent attacks of abdominal pain was the history of this case. Pyelography revealed a hydronephrosis, and the kink of the ureter to which this was attributable. Nephrectomy was curative.

Fig. 21. M. L.—This patient had a fixed tumour in the left abdomen associated with wasting and fever. Neoplasm and sepsis seemed equally possible clinically. Right pyelogram proved to be normal, while the left showed only two calyces filled. Operation showed this to be due to a perinephric abscess and drainage proved curative.

Fig. 22. A. S.—Large left " hypochondrioma " proved by pyelogram not to be renal. At a subsequent operation it was found to be splenomegaly due to Banti's disease.

Figs. 23. W. S.—Appeared healthy, but complained of recent attacks of right abdominal pain. A mobile mass was found in the right loin having the characters of a large renal swelling. Thanks to the pyelogram, which excluded the possibility of a renal origin, a diagnostic error and incorrect incision were avoided. A tumour defying removal and weighing $4\frac{1}{2}$ lbs. (1,850 grammes) was revealed at operation. It extended from the right loin to the left behind the lesser sac. Hemorrhage was profuse and resulted in death shortly after. Dr. Fraser reports it a fibroma.

Class VII.—Calculi. Fig. 24.

Fig. 24 (*a–c*). H. W.—This was a case of renal colic. The right ureteric catheter is seen to be acutely looped on itself, and had the radiologist not included the lowest level of the ureter in the skiagram, the large right hydronephrosis (30 c.c.) might well have been attributed to this twist. The cause of the trouble was, however, the calculus seen near the bladder. There was, at first, some doubt as to whether this shadow was within the ureter, since it was slightly off the line of the opaque catheter. The intraureteric position of the calculus was established by the further injection of opaque solution above it. Serial ureterograms were taken (Fig. 24, *b* and *c*). These showed the ureter dilated to the size of small intestine and the stone actually included in its shadow. This explained the anomalous twist of the ureteric catheter to be due, not to what appeared an incredible twist of the ureter, but to its looping in the spacious dilatation of the duct. Extraperitoneal operation allowed easy removal of the stone.

I wish to acknowledge my indebtedness to Dr. F. J. A. Mayes and his staff in the radiological department of the Bristol Royal Infirmary, on whose unstinted help the success of this work so largely depends.

THE MANAGEMENT OF THE NORMAL PUERPERIUM.

BY

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IN civilized communities labour cannot be considered a normal physiological function, however much we try to approximate it to this ideal. The civilized woman by her very civilization is rendered abnormal for the purpose of child bearing. She cannot, for example, bear the pains of labour, not because she is hysterical or a coward, but because her senses have been rendered hypersensitive by education and an artificial mode of life. How easy parturition is in a woman of feeble mind, and how tolerant she is of the pains of labour!

The puerperium, too, is not a normal physiological process. It was rendered abnormal when we assumed the upright posture. In the quadruped the pelvic organs are not supported wholly by means of the pelvic floor, and there is no danger of prolapse or malposition of the uterus if the four-footed female goes hunting immediately after giving birth to her young; but in woman uterine displacements are bound to occur, and do occur, if she assumes the upright position immediately or too soon after her labour. The "rational" puerperium is rational for animals and

savages but not for the civilized woman, and this is the patient whose puerperium we have to supervise.

The management of labour is more especially concerned with the immediate safety of the mother and child rather than with the future health of the mother. It is during the puerperium that treatment is directed towards the prevention of future morbidity. How often one hears the statement made by patients that they have never been well since the birth of one particular child, and more often than not this was a perfectly normal labour as far as the birth of the child was misconcerned. In a large number of cases this "ill-health" is due, not to the actual labour, but to management of the puerperium. After the child is born the practitioner is apt to leave the management of the patient to the nurse, being only concerned with any deviation from the normal, rather than with the routine treatment of the puerperium.

No rules of treatment can be laid down for every case; each patient has her own particular need, and circumstances will arise when the following routine is impossible, but I think that the management of the puerperium as described will give the most satisfactory results in the majority of cases.

Consider the condition of the bony and muscular structures of the abdomen and pelvis after labour. The pelvis is increased in size by softening and stretching of the ligaments binding the bony pelvis together, and the hips are splayed out, that is, the anterior superior iliac spines are wider apart after than before labour. The muscles of the pelvic floor, especially the pubo— and ischiococcygeus of opposite sides, are stretched and pushed apart by the passage of the child through the genital canal, and there is an area of the pelvic floor containing the vagina which therefore has no muscular

support. The fascial coverings of the muscles of the pelvic floor are also distorted and stretched. The uterus is an enlarged heavy organ with all its ligamentous supports, especially the round ligament, softened and stretched by pregnancy. The abdominal wall is stretched, even to the skin, and there is divarication of the recti. If by mischance or mismanagement we have added to these a torn perineum, then we have the loss of the support of the perineum and superficial perineal muscles.

It is at the restoration of these structures to the normal that we should aim in the management of the puerperium. If there has been a tear of the perineum, however slight, its suture is our first duty. Perineal tears should be sutured as soon after the delivery of the placenta and membranes as possible. In extensive tears an anæsthetic is necessary, to allow for accurate approximation of skin, muscle and mucous membrane, as only in this way can one get the absolute quiescence on the part of the patient which is so necessary for a successful repair.

If the patient has had an anæsthetic for the delivery of the child, this may be extended for a while and the suture or sutures for a slight tear put in, but not tied, before the placenta is delivered. For anything beyond a small tear repair should be performed at the end of the third stage, and it is most important that the repair should be thorough.

The mucous membrane of the posterior wall of the vagina should be sutured with catgut separately from the fibro-muscular tissue and skin, which is best sutured with deep silkworm gut sutures, taking a good "bite" of each wall of the tear. The skin may be approximated accurately, after cutting off any bruised edge or tag, by superficial silkworm gut sutures taking up the skin

only. In the event of a complete perineal tear, involving the sphincter ani, great care must be taken to approximate the two ends of the sphincter, and catgut is the best suture material. Silk and thread should not be used, as they are not absorbed and form a foreign body which, in the near neighbourhood of the anal canal, is almost certain to become infected, and as a result the whole perineum may break down. Suture of the sphincter is followed by careful suture of the anal mucous membrane, and after that the rest of the perineum is repaired as before described.

The ends of the silkworm gut sutures should not be cut short, as they tend to stick into the patient and cause discomfort. A convenient way of disposing of these ends is to knot the two together about three inches from the original reef knot and cut off the ends immediately distal to this second knot. This leaves a three-inch loop, which can be placed by itself or with others to one side of the tear and wrapped in sterile cotton wool. The advantage of this loop is again manifest when the sutures have to be removed, as a finger can be placed in the loop and the suture retracted. The place for cutting the suture at the edge is thus brought into view, even if the sutures have cut into the skin, as they are inclined to do; and having cut the suture, its extraction is rendered easy by pulling on the loop. It is advisable to tie the patient's legs together until she comes round completely from the anæsthetic, after which it is sufficient to warn her against stretching the thighs apart.

The after treatment of the repair is important; the great essential, as in all wounds, is to keep it dry. This is impossible in puerperal cases, on account of the lochial discharge, but one can keep it as dry as possible by frequent change of pads and by applying a dusting

powder of zinc oxide, borax and starch to the perineum. The great vogue and success of iodoform powder as a dressing for these cases was due, not to its antiseptic properties, which are practically negligible, but to its action in keeping the perineum dry. Its obnoxious smell, however, prevents its general use except for cases in which the lochia are offensive, when the iodoform acts as a deodorant.

After micturition or defæcation the perineum should be swabbed clean and the wound touched up with methylated spirits or tr. iodi, and powdered when dry.

The silkworm gut sutures should be removed on the seventh or eighth day, as by then union should have taken place. It is useless to leave them in longer, as by the eighth day after insertion they will have lost their grip of the tissues by cutting in—this can be easily seen by pulling on the loop—and are only acting as tracks for the ingress of bacteria. Immediately after the delivery of the placenta and membranes the patient is given a drachm of liquid extract of ergot by mouth or a tablet of "Femergin," which contains 1/65 gr. of ergotamine tartrate.

If the patient has had an anæsthetic I give a hypodermic injection of 1/130 gr. of ergotamine tartrate at this stage. In my opinion ergotamine tartrate is preferable to pituitary extract for producing uterine contraction; it acts with almost the same rapidity and does not at the same time cause a vaso-constriction. I have seen several cases of extreme collapse taking place within an hour or two hours after the administration of pituitary extract, and the cause of this I am certain is the sudden fall of blood pressure when the effect of the pituitary extract ceases; vaso-dilatation takes the place of constriction, and the patient bleeds into her own capillaries.

We now come to the debatable question of the abdominal binder. Many obstetricians regard this as a useless fetish handed down to us by the midwives and man midwives of the past, but in my opinion it is still a most essential adjunct in the management of the puerperium. To serve any useful purpose it must be applied tightly, and kept tight, and commence well down the thighs in line with the pubes. An extremely efficient type of binder is one which has a series of straps and buckles down the front, by which means the binder can be moulded to the contour of the abdomen and hips and kept tight. Binders secured by safety-pins soon become loose and require frequent adjustment. The object of the binder is twofold. The first, and by far the most important, is to prevent the splaying out of the pelvis which occurs as the result of the softening of the pelvic ligaments and slight widening of the pelvic joints. The binder acts by pulling the pelvis together, and so allowing for the retraction of the ligaments and the return to the normal shape of the pelvis, thus restoring the patient's figure, for which one will receive as many thanks as for the most skilfully conducted labour. The second object is the maintenance of intra-abdominal pressure, the binder taking the place of the slack abdominal wall. The maintenance of the intra-abdominal pressure is said to help the contraction of the uterus and so prevent post-partum hemorrhage, and also aid in the involution of the uterus. These results are, I think, extremely doubtful, and are more than counterbalanced by the binder preventing the proper working and use of the abdominal muscles. Were this, namely the maintenance of intra-abdominal pressure, the only object of the binder, I would discontinue its use ; but its aid in the return of the pelvis to normal is of great value. It is also a great comfort to the patient

herself in preventing that feeling of the pelvis falling apart of which many complain who have not had a binder applied. Lastly, it serves as a point of attachment for the pads.

The position of the patient in bed is a most important feature of the management. No longer does one keep the patient lying flat on her back unless there is a definite reason, as after post-partum hemorrhage, and even then only as long as there is danger of cerebral anæmia. As soon as the patient has been made comfortable after delivery, she is put in the Fowler position or with high " head " blocks, and a " donkey " placed under the knees. This position can be improvised in a private house by placing the head of the bed on the seats of two kitchen chairs. The advantage of this position is that the lochia can completely drain away from the vagina, whereas in the dorsal recumbent position the discharge collects in the vagina and simply overflows on to the pad, and this collection of lochia is a direct invitation to invasion by micro-organisms. Also, should the uterus become infected and the infection spread to the peritoneum, it will, in the majority of cases, be limited to the pelvis, if the patient is in the Fowler position. The patient should be told that she may turn on her side to sleep if she wishes ; in fact, there is no contra-indication in a normal healthy patient, except the presence of stitches, which will prevent her from assuming this position at any time. Even with stitches present, provided the thighs are tied together, she can lie on her side.

During the first day of the puerperium attention should be paid to the bladder and breasts. The bladder should be emptied regularly and the urine not allowed to accumulate to the point of distention, as a distended bladder prevents contraction of the uterus, and invites

urinary infection. The patient should be encouraged to empty the bladder naturally and only as a last resource should a catheter be used, as some patients get into a "catheter habit" which may last for several days. On the other hand, the bladder should not be allowed to become distended, as this may lead to the patient being unable to pass urine at all owing to atony of the bladder, or she will only pass a small quantity at each act of micturition; under these circumstances catheterization is essential. In this class of case hexamine gr. 10 and acid sodium phosphate gr. 30 given three times a day will prevent urinary infection and produce a certain amount of vesical irritability, which will give rise to the desire for natural micturition at fairly frequent intervals, so preventing over-distention and the need for catheterization.

The breasts should have already been attended to during pregnancy and any defects in the nipples treated. This treatment should be continued during the puerperium. The nipples should be hardened with Eau de Cologne or other spirit and, if indrawn, manipulated by the doctor's or nurse's fingers, aided if necessary by the use of the breast pump. If the nipple projects sufficiently to be grasped by the child's mouth, then the normal projection will soon be produced by the child's suckling. The child should be put to the breast regularly from the very first day, as this stimulates the breast glands to secrete and the uterus to contract, and accustoms the child to take the breast. The hours of feeding should be regular; whether three-hourly or four-hourly, and whether at night or not, depending entirely on the size and nutrition of the child. No definite rule can be laid down for every child, but in normal circumstances four-hourly feeds are best with an eight-hour interval from 10 to 6 at night

between feeds; this last gives the mother a sufficient night's rest which is so essential, and it also rests the breasts. Strict attention must be paid to the cleansing of the nipples before and after feeds, and any abrasion noted and treated.

On the night of the second day an aperient must be given, and castor oil is best for this purpose, as the desired result is sure and there is no effect on the child. After the second day the bowels can be regulated, if necessary, by means of liquid paraffin and cascara evacuant either once or twice a day, or by one of the liquid paraffin preparations in combination with agar-agar.

The mother's diet should be plain and nourishing, avoiding anything which may indirectly affect the child's digestion, otherwise she may have a normal diet after the bowels have been opened on the morning of the third day. Between meals she should have plenty of milk to drink, at least two pints of milk during the day, either as plain milk or cocoa made with milk or made up in the form of groats, which is an excellent galactogogue. Strong tea and coffee should be avoided and alcohol is unnecessary. The value of stout as a galactogogue is questionable, and in the majority of cases it produces adipose tissue rather than breast milk.

During the fourth and fifth days the breasts may become engorged with milk, and care must be taken to see that this engorgement is relieved, either by the child or by means of massage of the breasts and attention to the bowels. The child may be frightened from taking the breast during this engorgement, or at any time that the breast milk is excessive, on account of the sudden stream of milk which is projected into his mouth and chokes him when he first seizes the nipple. This may be prevented by drawing off a small quantity of milk

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by means of the breast pump before putting the child to the breast.

On the fifth day of the puerperium abdominal exercises must be commenced, and I regard these as one of the most important items in the prevention of future morbidity.

Before commencing the exercises the binder is undone in its upper abdominal half, so as to allow free play for the abdominal muscles. The first exercise consists in raising the head and shoulders from the bed while the patient is lying flat on her back with the arms by the sides. This is done twice a day, and regulated by the nurse so that it does not unduly fatigue the patient. Exercises should never be carried out to the point of fatigue. At first this exercise can only be done for a few minutes, but after a day or so longer time can be devoted to exercises and fresh ones introduced. The object of this particular exercise is to strengthen the recti and indirectly all the abdominal muscles.

After the exercises the patient turns over and lies flat on the abdomen, which may be supported at first by means of a pillow placed under it, but this should be discontinued later. This position throws the uterus forward and so rests the strain on the round ligaments, and if this is done for an hour or longer twice a day the chances of the uterus becoming retroverted are extremely small. Retroversion is in the majority of cases due to the patient lying on her back during the whole of the puerperium. The constant strain on the round ligaments produced by the action of gravity on the heavy, involuting uterus is the main cause, and this is inevitable while the patient is in the supine position. Most patients get used in a short time to lying on the abdomen, and will read their books, which are propped up against the pillow, and many times I have

found them, having fallen asleep while reading, in this position.

After the seventh day the patient is no longer kept in the Fowler position at night, but allowed to sleep as she would normally, and encouraged to sleep lying on her side rather than on her back.

Exercises are continued as before and fresh ones added. In the first of these the patient, lying on her back with arms to the sides and binder removed, slowly raises in turn first one and then the other lower limb with the knee held rigid. Later both legs are raised together, and then the lower half of the trunk, the weight being taken by the shoulders and the arms, which are held stiffly on the bed. In another exercise, with the patient lying on her side, the leg stroke in swimming is imitated, and this is repeated on turning over to the opposite side.

By means of these exercises the muscles of the abdomen and pelvis are brought back to their normal tone, and all laxness is taken up before they have to bear the weight of the abdominal and pelvic contents, with the result that after-complications of pregnancy, such as visceroptosis and prolapse, are to a considerable extent prevented.

These exercises can be performed under the supervision of the midwife, and do not require the services of a masseuse; in fact, they can be performed without supervision if the warning against the production of fatigue is given and heeded. Thus there is no extra drain on the patient's financial resources, and as a consequence exercises can be performed by the poorest as well as the richest of our patients. If, however, the patient can afford a masseuse they can be performed under her direction, and their benefit greatly enhanced by the addition of abdominal massage. Massage not

only increases the muscular tone but disperses the superfluous abdominal fat, which tends to collect during pregnancy and the puerperium, and increases the elasticity of the skin.

The patient is allowed to sit out of bed daily, from the tenth to the fourteenth day, and the abdominal binder may now be discarded. It is better to keep a mother in bed for fourteen days, but circumstances, financial and otherwise, may not permit of this. In every case, before she is allowed up, it is a *sine qua non* that the uterus can no longer be felt on abdominal palpation and that the lochia are clear and normal.

Abdominal exercises should be continued even when the patient is sitting out of bed each day, and if this is done it will be found that she will be able to walk quite steadily at her first attempt, and there is very little, if any, giddiness or stooping such as one sees in other patients who have not had exercises.

Involution takes from six to eight weeks to complete, and it is necessary to warn the patient before leaving our care that she must not lift any heavy weight, especially in a stooping position, for at least two months after her baby's birth.

So we bring the mother to the time, either three weeks or a month after parturition, depending on circumstances chiefly financial, when she must resume again her daily duties. It is our hope that, by strict attention to the management of the puerperium, the mother is, and will be in the future, a perfectly healthy woman.

PLATE IX.

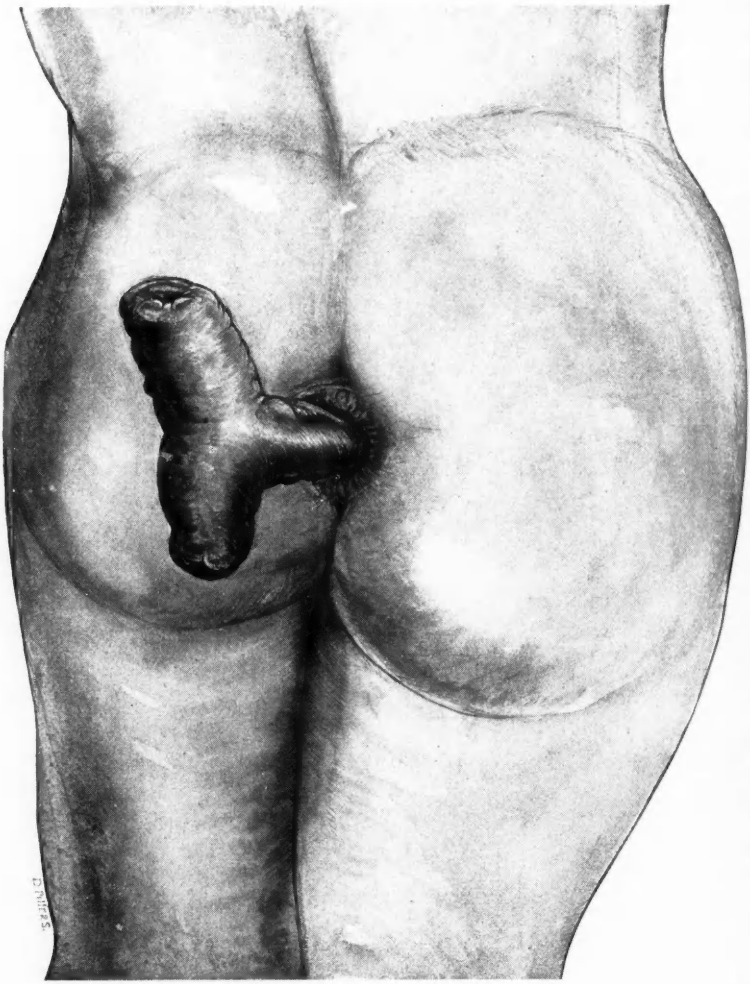

FIG. 1.
Clinical condition before operation.

A CASE OF RECTAL PROLAPSE.

BY

D. ROBERTSON, M.B., Ch.B. (Edin.),

AND

D. G. C. TASKER, M.S. (Lond.), F.R.C.S. (Eng.).

ON many occasions in the practice of surgery one is at a loss for an explanation of some pathological condition. One of the most bewildering of these occasions was furnished by a case of rectal prolapse.

When seen in March, 1927, the patient, an unmarried woman aged 40, complained of having something "come down from the back passage." On getting her to lie on her left side and inspecting the anus, the condition depicted in Fig. 1 presented itself. This extraordinary T-shaped protrusion became more inexplicable the more it was examined. Thus the examining finger could be passed into the anus quite easily around the stalk of the prolapse, the stalk appearing to come from part of the bowel higher up than could be reached with the finger. The protrusion itself was obvious bowel, covered with mucous membrane and turned inside out. Also the ends of the cross-piece of the T were open, and the fingers passed into each met in the middle and could both be passed up the stalk of the T. Vaginal examination revealed nothing, and abdominal examination was negative. By manipulation the whole prolapse could be reduced, so that ultimately nothing abnormal was palpable by a finger in the rectum or vagina.

Mere inspection and palpation of the prolapse did not suggest its nature, nor, as will be seen, did the following history that she gave us.

The medical history of her life was lengthy, and her description of past illnesses and of her symptoms was given with that meticulous care and accuracy so typical of a neurotic patient. Out of a great mass of details the following points appeared to be the salient features :—

As far as she could remember she had never been well in her life, and she had been in various institutions in Bristol on account of hemorrhages which appeared spontaneously in all parts of the body, but usually subcutaneously. The cause of these was ascribed to a blood disease—thrombocytopænia—but the only obvious finding in a complete blood count was an anæmia with 3,500,000 red blood cells to the cubic millimetre.

She had apparently always had some abdominal pain not typical of any organic condition, but had never had any marked exacerbation, nor had she ever had any operation. For some years she said she had had " piles," *i.e.* some bleeding from the rectum, and for the last eighteen months had had diarrhœa up to eight to ten times a day, with blood. For the last six months this prolapse had been coming down at infrequent intervals. During the last three weeks the prolapse had come down much more frequently, and was causing marked pain until it was reduced.

It was ascertained that she was not losing weight, and that she was able to take ordinary food, but for some reason she did not feel able to get about, but had remained in bed for some months. For some years she had been taking 4 oz. of laudanum a week to obtain sleep, although it did not appear that pain prevented this.

It was thought that the condition must be of the nature of some congenital diverticulum of the bowel which became prolapsed and everted, and it was hoped that X-ray examination with a barium enema and sigmoidoscopy would throw light on the cause of the prolapse. The sigmoidoscopy, however, showed nothing abnormal, and the barium enema showed a

confusing mass of coils of intestine apparently doubled over on themselves.

It was thought that if the coming down of the prolapse could be prevented relief would be attained, and so in June, 1927, after two X-ray treatments to the spleen for the sake of the blood disease, an operation was performed under general anæsthesia. At this operation the colon appeared normal but voluminous, and the whole length of it was found mobile. No diverticulum was seen. The lower part of the sigmoid colon was fixed to the tissue on the ventral aspect of the iliac crest by turning back a small flap of peritoneum of the area and also a flap of peritoneum of the colon and suturing the two bare areas together. The abdomen was then closed and the patient put in the lithotomy position.

An incision was made between the coccyx and the anus, and by blunt dissection the area between the hollow of the sacrum and the rectum was opened up. This was packed with a large mass of gauze, which later was changed every other day.

The patient recovered well from this operation, and after two months the perineal incision was healed. For the first few days the bowels were kept closed with pulv. cretæ aromat. cum opio, but after this time the diarrhœa returned, at first about nine times a day and later as much as fifteen to twenty times a day.

All went well with the prolapse until July, 1928, when it reappeared, just the same as before, on two occasions. When it was reduced, digital examination whilst the patient was straining did not show any tendency to prolapse of the lower part of the rectum, and it was thought that the prolapsed piece of bowel was that between the part fixed to the side wall of the pelvis and the rectum fixed by the fibrous tissue resulting from the perineal operation.

The return of the prolapse had a marked mental effect on the patient, and she begged for something further to be done, and so in September, 1928, a further operation was performed. At this operation it was determined to fix in some way that part of the colon and rectum between the colopexy and the peritoneal floor of the pelvis, as it was felt that the secret of the prolapse

lay there. This secret was now revealed. As will be seen from Fig. 2, which represents the state of things seen with the patient in the Trendelenburg position, there was a wide fistulous communication between a part of the lower ileum about two feet from the ileo-cæcal valve and the rectum immediately above the peritoneal floor. This communication was easily dealt with. It was divided between two clamps, and the gap in each viscus was closed with two layers of stitches, the abormal communication between ileum and rectum being thus abolished. No other abnormality was found, and it was seen that the fixation of the colon to the iliac fossa was still intact. Recovery from the operation was uneventful, but now instead of an intractable diarrhœa a most intractable constipation had supervened. Instead of fifteen to twenty actions of the bowels a day, there is such a constipation that in spite of prodigious doses of aperients no action of the bowels can be obtained except once in five days, and that only with repeated enemata. Without aperients or enemata it appears that the bowels would never be open of themselves. In March, 1929, there has been no return of the prolapse, and the patient is as before, except that the diarrhœa has been replaced by marked constipation.

Fig. 3 gives a diagram of the condition found at the second operation, and it will be readily appreciated that the prolapse consisted of the ileum prolapsing through the fistulous communication between ileum and rectum and then becoming like two intussusceptions.

The cause of the fistulous communication can only be guessed at. It did not appear to be congenital, as the union of the two pieces of bowel when divided appeared to consist of ordinary fibrous tissue. It seems that it must have originated from something in either the rectum or ileum having ulcerated through from one piece of bowel to the other. Whether there was some indigestible material swallowed by the patient which

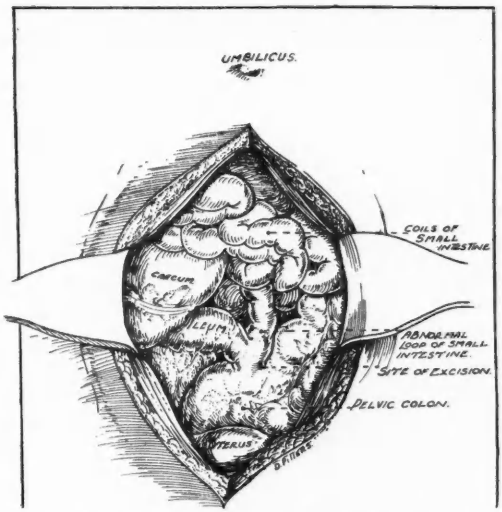

FIG. 2.—*Condition discovered at operation. (Patient in Trendelenburg position.)*

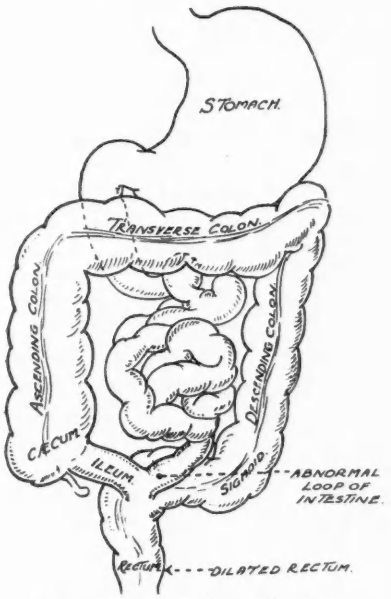

FIG. 3.—*Diagram of abnormality of viscera.*

became impacted in the innermost part of the ileum, *i.e.* two feet from the ileo-cæcal valve, and then ulcerated through the adjacent rectum, or whether the communication was made from below by a foreign body inserted by the patient into the rectum, remains guess-work. The case, however, remains one of the strangest that we have been able to trace in surgical literature.

Reviews of Books

Medical Essays. By C. O. HAWTHORNE, M.D. Pp. iv., 246. London: John Bale, Sons & Danielsson Ltd. 1928. Price 4s. 6d.—This book contains 49 essays upon subjects which are peculiar to the training and practice of the medical profession. In the opening chapters, dealing with education, the author claims that the width of the training entailed constitutes one of the most attractive features of the medical profession, but he regards the curriculum as being by no means beyond criticism, and insists upon the great importance of clinical as compared with academic teaching. He considers that lectures are essential because "the inspiration of the living teacher is as necessary in medical training as are hospital practice and library study." In discussing the therapeutic value of drugs the author maintains that they should not be neglected simply because they may be powerless to neutralize directly the cause of disease; for, on the other hand, they may assist nature by relieving untoward symptoms. In a collection of useful and interesting essays, such as this book presents, it would be impossible to select the most important, but the short chapter dealing with professional secrecy must commend itself to all who read it. Each essay is readable, well put, and nicely expressed.

Medical Adventure. By E. WARD, M.D., F.R.C.S. Pp. xii., 291. London: John Bale, Sons & Danielsson Ltd. 1929. Price 8s. 6d.—We have not met a book quite like this before. It is a series of essays strung together by no link other than that of the author's personality. We confess that we took it up for review with no expectation of enjoying it, but the first chapter—that on legal adventures—was so alluring that we went straight on with it, and found much that was entertaining, much that was instructive, and almost nothing that was dull. Some of the clinical essays—for example, that on erythema nodosum, the conclusion of which agrees closely with that of Dr. Symes's Long Fox Lecture—prove that Dr. Ward is not merely a clever and attractive writer but also a careful observer. Finally, he may be congratulated on being in a position to write that last essay, one entitled, "A subjective study of encephalitis lethargica." Articles by doctors on their own illnesses are always very instructive. Altogether this book is excellent value for the money.

Mirror Writing. By MACDONALD CRITCHLEY, M.D., M.R.C.P. Psyche Miniatures, Medical Series No. 11. Pp. 80. London: Kegan, Paul, Trench, Trübner & Co. 1928. Price 2s. 6d.—In this brief "libel" (to use the term in its original sense) Dr. Critchley gives an admirable account of the curious phenomena of "mirror writing," "inverted writing" and "backward speech." He describes how these phenomena may occasionally be the accompaniments of subnormal mental powers, but he quite fairly quotes the instance of the best known of all mirror writers, Leonardo da Vinci, who wrote mirrorwise from the age of twenty, whose mental faculties, although amounting to genius, were never in the least "to madness near allied." On the whole Critchley perhaps favours the theory of mere left-handedness as best explaining "mirror writing," though he recognizes the difficulty of accepting this to explain why Hebrew, Hindustani and Arabic writing should run from right to left. He adds an interesting note of a personal inquiry which he made, showing that out of 107 Egyptian clerks at the Egyptian Ministry of Health only one could write more easily with the left hand than the right. But it is an entertaining account of a series of little understood speech—and writing—diversities.

Cytoarchitectonics of the Human Cerebral Cortex. By C. VON ECHONOMO. Translated by DR. S. PARKER. Pp. xii., 186. Illustrated. London: Oxford University Press. 1929. Price 21s.—This book, as its title implies, deals with the detailed cellular structure of the cerebral cortex. In recent times, with advances in the study of psychiatry and mental deficiency, more and more attention is centring around the detailed structure of the cerebral cortex, and considerable progress is attending efforts to correlate structure with function. Von Echonomo has expended a vast amount of time and labour in determining the differences in minute structure attaching to the various regions of the grey matter of the cerebral cortex. It is, perhaps, a little depressing to the average reader to realize that he has succeeded in differentiating no less than 109 areas of varying structure. However, certain fundamental groupings stand out from the general mass of detail. The rhinencephalon, which occupies but a tiny portion of the human cortex, appears essentially different in its histology from all the rest of the cortex, while the general six-layer lamination is recognizable over the rest of the grey matter of the cerebrum. The relative development of the various layers differs widely—the broad

distinction being between the relative preponderance of pyramidal and of granular cells—pyramidation being significant of efferent functions, and granulation of cortical receptive areas. One of the difficulties for the reader is the extensive new terminology which is used throughout the book, and it is difficult, in the main, to harmonize most of the author's descriptions with those appearing in older text-books. This difficulty, however, appears inevitable where a large amount of new knowledge is added to our previous store. In the last chapter the general implications which follow from the detailed structure of the cerebral cortex are well summarized, and present a comprehensive survey of the book, which should prove very readable to anyone who is interested in general conclusions but finds detailed histology irksome. The book is beautifully illustrated with a wealth of excellent microphotographs which are described in so much detail that they require very close attention. The book is undoubtedly a valuable addition to our knowledge of the branch of neurology, which is only beginning to receive the attention it deserves.

Low Blood Pressure, its Causes and Significance. By J. F. HALLS-DALLY, M.A., M.D., M.R.C.P. Pp. xvii., 257. London: William Heinemann Ltd. 1928. Price 15s. —Dr. Halls-Dally follows up his book on *High Blood Pressure* with a companion volume dealing with the other extreme. He says truly, "Although the literature of medicine abounds with references to high blood pressure, little mention is made of the conditions under which low blood pressures occur." So this volume is devoted to a consideration of all the conditions with which low arterial pressure may be associated. Briefly they may be grouped as acute infections, chronic infections, chronic wasting diseases, endocrine defects and the little understood conditions of shock and collapse. The author rightly attributes to "hypopiesis" many of the symptoms met with in neurasthenia, "the subject is more often than not apathetic, miserable and distressed." He points out how small a rise in the systolic pressure may be attended by marked benefit in the feelings and state of the victim. One symptom on which he lays stress is the insomnia of hypopiesis, which, he says, "occurs early in the morning, the patient getting off to sleep without much difficulty, but becoming wakeful from about 2 a.m. onwards, with snatches of broken sleep, from which he wakes weary and unrefreshed." Altogether this is a book full of careful and practical observations, with many valuable hints on treatment.

Nephritis. By A. C. ALPORT, M.D., M.R.C.P. Pp. xvi., 175. Illustrated. London: Wm. Heinemann Ltd. 1929. Price 7s. 6d.—The author is to be congratulated on having succeeded in a very difficult task, namely that of writing a concise, clear and really practical text-book on the subject of nephritis. This is a book which, although ostensibly written for the student and practitioner, will be constantly referred to by all branches of the profession, and on all points it will be found full of useful information, and clear of the mass of ancient theory and practice which has so obscured our knowledge in the past. No doubt Dr. Alport's classification of the various forms of nephritis will be challenged, but it has the merit of being of real practical service. The various tests of renal efficiency are given in detail, and it is demonstrated that they are such as can be performed by the general practitioner. The relationship between such tests and modern views of the physiology and morbid anatomy of the kidney are clearly set forth, and much emphasis is laid on the important part played by focal sepsis in the causation of nephritis. The question of treatment is most ably handled, and the reasons for using different methods of treatment in each variety of nephritis are explained. There is a valuable appendix of prescriptions for use in renal diseases, and an excellent modern bibliography. The book will do much to establish the diagnosis and treatment of nephritis on a truly scientific basis.

Autolycus, or the future for Miscreant Youth. By R. G. GORDON, M.D., D.Sc., F.R.C.P. Pp. 94. London: Kegan Paul, Trench, Trübner & Co. Ltd. 1928. Price 2s. 6d.—An excellent little book, written in a light and easy style, which should be read by parents and schoolmasters, in fact by everyone who is directly interested in the training of children. The carrying out of Dr. Gordon's "aims of the future" will cost money, but to deal in any way seriously with the problem of mental deficiency money must be spent. Although only 8 per cent. of the miscreant youth themselves can be certified under the Mental Deficiency Acts, surely at least one of their progenitors is, in most cases, mentally defective, and when these are dealt with effectively, the time will come when, as Dr. Gordon foresees, "no misfits or defective personalities will be brought into the world." In the Mental Deficiency Act, 1927, the fourth class of defectives are called "moral defectives," but on page 60 the term "moral imbecile" is used. Doubtless this error will be corrected in future editions.

Elementary Medicine in Terms of Physiology. By D. W. CARMALT JONES, M.D., F.R.C.P. Pp. viii., 360. 4 figures. London: H. K. Lewis & Co. Ltd. 1929. Price 12s. 6d.—We hope that this book will be widely used by medical students in this country. It has many virtues to commend it. Its author has had, both in England and in New Zealand, a wide clinical experience. He has also been occupied in the teaching of medicine for many years. He has the gift of relating details to principles, of discerning in symptoms and physical signs the aberrations of physiological process. Last, but not least, he has the faculty of expressing very clearly these relations between the normal and the abnormal. His book could be read by any student in a fortnight, and should provide an excellent introduction to clinical medicine.

The Troubled Conscience. By C. BLONDEL. Pp. 91. London: Kegan Paul, Trench, Trübner & Co. Ltd. 1928. Price 2s. 6d.—As far as can be gathered from this little book by Charles Blondel, his idea is that cinesthetic (ought it not to be cinæsthetic?) impulses not ordinarily noticed rise into consciousness and cause feelings of suspicion and fear. The inability to express these or describe them in ordinary language, in spite of our attempts to do so, results in that incoherence of speech and conduct so common in the insane. Unfortunately for this theory, the very cases, viz. hypochondriacal, in which we infer that afferent impulses from the viscera are the cause of the morbid sensations, are not particularly incoherent in speech or violent in conduct. The "poor lunatic" has at any rate justified his existence by supplying material for the numerous theories of dreamers, and the little book is quite worth reading, if only to see what the "reputed sane" will say about the "alleged insane."

Lipiodol in the Diagnosis of Thoracic Disease. By F. G. CHANDLER, M.D., F.R.C.P., and W. BURTON WOOD, M.D., M.R.C.P. Pp. viii., 133. Illustrated. London: Oxford University Press. 1928. Price 10s. 6d.—This book, in a short space, gives the present position of knowledge and practice as to the use of lipiodol in pulmonary disease. There is a very useful chapter on the detailed technique for the introduction of lipiodol into the air passages. The actual clinical value of the method is very fairly reviewed and offers much food for thought. The greater part of this small book is taken up with a series of excellent radiograms, which are in themselves a valuable contribution to the literature of the subject.

The Art of Surgery. By H. S. SOUTTAR, D.M., M.Ch., F.R.C.S. Pp. viii., 624. Illustrated. London: William Heinemann Ltd. 1929. Price 30s.—This book is of an unusual character, both in the selection of the subjects described and in the method of illustration. The professed ideals at which the volume aims have our most cordial sympathy. The chief of these ideals is that of lightening the student's burden by omitting what is not essential and by describing very fully what is fundamental. But we must confess at the outset that we are disappointed that in both aspects the ideal has not been fully carried out. In the first place we ask ourselves how much of the ordinary text-book contents has been omitted, and as we look through the titles of the chapters we seem to find almost exactly the same subjects as those with which other text-books have made us familiar. Really the only real omission which tends to lighten the student's task is that of operative details and appliances. On the other hand, in spite of the fact that the book contains over 600 pages, it has not been possible to give detailed description of fundamental points. For example, fractures of the femur occupy only three and a half pages. However, in spite of its faults and shortcomings, the book has a great and attractive charm, namely that it represents the opinions and practice of its author, a surgeon of very wide experience and great originality. It is written in a very easy style, and the wide margin containing both headings of paragraphs and thumb-nail sketches make it very easy for reference. It would serve no useful purpose to go through the book, commenting on various opinions about surgical practice, with which we may differ from the author. In regard to the general surgical diseases and principles, the author does not depart widely from generally accepted teaching. In regard to the problems of fractures, we regard the opinions expressed as being rather behind the times. Pott's fracture treated by laying the leg on its outer side on a pillow, fractures of the neck of the femur treated by traction in bed and the omission of reference to non-union and mal-union are examples of this. The sections on cranial surgery are, as one might expect, rather more advanced than is usual in a text-book of this kind. Lastly, we feel that no review would be adequate that did not refer to the remarkable character of the illustrations. Quite frankly we do not like them, but perhaps this is our want of appreciation of modern artistic methods. The coloured illustrations are all of an impressionist character, which may have great merits as works of art, but convey a very poor idea of accurate detail. The thumb-nail sketches vary very much in quality; those

which are merely diagrammatic, such as representation of a fracture or dislocation, are very useful, but those which represent the face, for example, in goitres are very poor. No doubt, however, the reputation of the author, the charm of the writing, and the originality of the work will make it very popular in spite of superficial faults, which we hope will be corrected in future editions.

Elements of Surgical Diagnosis. By Sir A. PEARCE GOULD, K.C.V.O., C.B.E., M.S., F.R.C.S. Seventh Edition. By E. PEARCE GOULD, M.Ch., F.R.C.S. Pp. xvi., 730. Twenty-six plates. London: Cassell & Co. Ltd. 1929. Price 12s. 6d.—*Surgical Diagnosis* is one of the operator's best friends, for on its accuracy depends chiefly the degree of success attained by the average surgeon. This book occupies a premier position among English surgical text-books, for it embraces a most complete and well-written description of the whole range of surgical disorders both in trunk and limbs. It is good that the author brings it up to date by frequent revisions, and maintains the high repute of the original work. In this edition the application of the radiography of opaque injections for gall-bladder disease and obstruction of the spinal theca are among the lucid radiograms scattered through the book. Most valuable is the solemn warning on p. 478 that it is the doctor's duty to lose no time in settling with certainty the nature of every tumour of the breast. Though this sounds a sorry comment on medical practice, this warning perhaps calls for printing in heavy type at the end of the chapter, for lives are still lost from its neglect. A few omissions are perhaps regrettable. No reference is found to endothoracic goitre, simple retro-peritoneal tumours or that serious and obscure diagnostic puzzle known as carbuncle of the kidney, which stands notably in need of broadcasting. In addition, does not thorough elucidation of pyorrhœa alveolaris call for the aid of X-rays? But in truth anything other than commendation seems out of place for this masterly text-book.

The Injection Treatment of Varicose Veins. By A. H. DOUTHWAITE, M.D., M.R.C.P. Third Edition. Pp. 51. London: H. K. Lewis & Co. Ltd. 1928. Price 4s.—The success of this small book, which has justified the publication of a third edition, is the best evidence of its usefulness. It represents a careful account of what is now recognized as a simple, safe and useful method. It is based upon an experience of nearly 2,000 cases, and the author therefore considers himself

justified in describing the essential procedure as perfectly simple, easy of performance, invariably effective and perfectly safe if employed with reasonable care. He claims that the worst cases of varicose veins are those in which the most brilliant results are obtained. In the new edition the main changes relate to alternative solutions which the author has found useful. In the majority of cases he uses a solution of quinine and urethane, and he now suggests that the following solutions are sometimes useful, namely a mixture of sodium salicylate and sodium chloride, sodium chloride alone or a 66 per cent. of glucose. He does not support the suggestion of ligaturing the internal saphenous vein at the same time that injection is made.

An Index of Symptomatology. By several Authors. Edited by H. LETHEBY TIDY, M.D., F.R.C.P. Pp. xii., 710. Illustrated. Bristol: John Wright & Sons Ltd. 1928. Price 42s.—We presume this volume completes the *Index* series which has added to the reputation of the publishers. Although at first sight it might seem to overlap the *Diagnosis* volume, a new edition of which appeared recently, a brief examination of its contents and of the way in which they are arranged will prove that this is not so. The reader who takes down the *Diagnosis* volume will do so in order to discover the possible origins and implications of some symptom which he has observed. This new *Symptomatology* volume, on the other hand, tells him what clinical picture to expect in any given disorder. The book is in encyclopædia form, consisting of brief paragraphs headed by names of diseases and alphabetically arranged. This is backed by a supplementary index of several thousand references, and it is therefore easy to find quickly a clinical description of any disease. We advise readers to look up their subjects first under the encyclopædia heading, and if this fails to show them what they want, to rely on the supplementary index. We have tested the book in this way, and find it difficult to discover any serious omission. The paragraphs have been prepared by twenty-six authors, the largest contributor being the indefatigable editor himself, who is to be congratulated on the successful issue of a difficult and prolonged labour. In his preface he invites criticism. We have only one small question to ask, namely whether scurvy is not "C avitaminosis" rather than "vitaminosis." The pictures are excellent, as is usual in the books published by this firm, who have once more demonstrated their capacity for discovering what the medical profession needs, and meeting that need admirably.

A Patient's Manual of Diabetes. By HERBERT W. MOXON, B.A., M.R.C.S., L.R.C.P. Pp. xi., 132. London: H. K. Lewis & Co. Ltd. 1929. Price 6s. net.—Dr. Moxon, who is Honorary Physician to the Perth Hospital in Perth, Western Australia, has adapted a course of nursing lectures to the needs of his patients. He says in his preface that he considers it impossible to give to patients "too full and complete a grasp of what manner of disease diabetes really is." This perhaps is true provided the "grasp" can be guaranteed. We are inclined to think, however, that an "account" of a disease by an author and the "grasp" of that account by the patient may not be identical. Frankly, Dr. Moxon's physiological descriptions seem far above the understanding of most English patients. For his principles of treatment he relies on such well-established authorities as Maclean, Lawrence and Harrison. He still advocates some degree of preliminary starvation, a method almost entirely abandoned elsewhere and not unattended by danger. He is not quite convinced that insulin has made pregnancy safe for the diabetic woman. The book is well printed and well arranged.

Maternity and Child Welfare. By ETHEL CASSIE, M.D., Ch.B., D.P.H. Pp. viii., 228. Illustrated. London: H. K. Lewis & Co. Ltd. 1929. Price 8s. 6d.—Dr. Cassie's book on maternity and child welfare is written as the result of excellent practical experience, and should be read by all nurses who are thinking of taking up health visiting as a profession. It may also be read with advantage by those to whom this work is little more than a name; to them it will give a good general impression of the valuable work undertaken by this department. Although Dr. Cassie mentions the fundamental principle of child welfare work, and points out that for the purely clinical nurse it has no real appeal, more stress might have been laid in the opening chapters on the fact that the work is essentially preventive; that the aim, in addition to the instruction of the ignorant mother, is the supervision of the healthy child, and the handing over to medical care of the mother or child as soon as the earliest signs of disease appear. Some of the chapters in Sections 2 and 3 appear to be somewhat out of place, as, of necessity, they are not detailed enough to be really instructive to the trained worker; but the health visitor, who is beginning her work, will find much that is useful in the book, particularly the chapters on infant feeding and child management, and the schedule which gives an outline of the most important points to be dealt with in home visiting.

Deafness and its Alleviation. By V. NESFIELD, F.R.C.S. Pp. vi., 85. 19 illustrations. London: H. K. Lewis & Co. Ltd. 1928. Price 7s. 6d.—In the earlier pages of this work a brief but lucid account of the anatomy and physiology of the ear is provided, followed by a description of the nature of deafness, including that due to acute and chronic suppuration. Then treatment is considered, including that of the related conditions of the nose and throat. Many useful hints for the general management of the deaf are given in this section. Later the author writes: "But if the patient is more than a little deaf, and particularly if incapacitated by deafness, then I advise operation." The operation consists in making an opening into the attic of the tympanum through the mastoid process, close behind the osseous meatus. Part of the latter is removed and a meatal flap turned back. An extra "pocket" is "given to the middle ear . . often quite sufficient to keep the Eustachian tube patent, by giving an additional 1 c.c.m. expanding space." The author has operated on over 300 patients in this way. A few case records are appended. In some of these the improvement of hearing power recorded, even when apparent nerve-deafness existed previously, was little short of miraculous. The book is one which will repay perusal. The earlier portion will be helpful to the general practitioner, and the sections on the operative treatment cannot fail to interest specialists and challenge their criticism.

Principles of Clinical Pathology in Practice. By G. BOURNE, M.D., M.R.C.P., and K. STONE, M.D., M.R.C.P. Pp. xii., 392. Illustrated. London: Oxford University Press. 1929. Price 16s.—This book deals principally with the theoretical side of clinical pathology. The intention of the authors is to supply the clinician with sufficient information to decide the necessary tests and interpret the laboratory findings. The technical details of the various tests have been omitted, except where their inclusion would help towards a proper understanding of the pathology of the disease in question. There are eight sections, which deal in turn with specific infections, diseases of the blood, diseases of the cardiovascular, gastro-intestinal, respiratory and urogenital systems and metabolic and allergic diseases. The pathology of each disease is described, the methods of investigation are indicated and the correct interpretation of the test findings explained. An appendix contains directions for the collection and preservation of material. There is an extensive list of references at the end of each section. The book is particularly suited to the clinician's needs, and we can confidently recommend it.

Practical Chiropody. Third edition. By E. G. V. RUNTING. Pp. xii., 200. London: Faber & Gwyer Ltd. 1928. Price 5s.—In these days of ready-made and often badly designed footwear a very large proportion of our population is more or less severely crippled by corns, bunions and other painful affections of the feet. The busy general practitioner has often insufficient time to treat these conditions adequately, and is very glad to hand them over to the chiropodist. It is for the latter that this book is written. The etiology, pathology and treatment of minor, but none the less important, foot troubles are clearly and simply set out. Mr. Runting's book should prove of great value to the chiropodist. We are glad to notice that stress is laid upon the importance of referring to a qualified medical man all those cases which do not yield to treatment, or which do not fall strictly within the sphere of the chiropodist. The practitioner himself might gain several useful hints from a perusal of this handy little book.

An Index of Differential Diagnosis of Main Symptoms. By VARIOUS WRITERS. Edited by HERBERT FRENCH, C.B.E., M.A., M.D., F.R.C.P. Fourth Edition. Pp. x., 1,171. Bristol: John Wright & Sons Ltd. 1928. Price 63s.—The fourth edition of this well-known book will certainly meet with the same welcome as its predecessors. The high standard of the former editions is fully maintained. We have praised the work before, and as time goes on its usefulness, particularly to general practitioners, becomes more widely appreciated. The numerous illustrations add greatly to its value, they have been chosen with excellent judgment and are reproduced (especially the coloured ones) most admirably. The index, extending to 227 pages of small type, is a marvel of completeness and correctness. No section will give a better idea of the scope of the work than the numerous articles dealing with "Pain" (pp. 524–594). Here are thoughtful and suggestive monographs by various authors dealing with regional pain. In another place twenty-four pages are devoted to the causation and recognition of causes of prolonged pyrexia. X-ray diagnosis is among one of the many recent advances which are helpfully discussed. It is a big undertaking to attempt a differential index of symptoms, but Dr. French is to be congratulated on bringing out this new edition and having brought it so admirably up to date. The publishers (Wright of Bristol) maintain easily their position as leaders in illustrated medical literature with this volume.

Deformities in Infancy and Early Childhood. By M. F. FORRESTER-BROWN, M.S., M.D. Pp. xii., 199. Illustrated. London: Oxford University Press. 1929. Price 14s.—This book has been written especially for those in charge of obstetrical and infant-welfare clinics, in the hope that it may help them to recognize deformities in infancy and childhood, and, by instituting treatment at the earliest opportunity, may avoid the necessity for those drastic measures which so often become unavoidable in neglected cases. With this aim in view details of treatment are restricted to non-operative procedures. The book is divided into six sections dealing with different regions of the body and limbs. Illustrations have been carefully selected to help out the text, and they are admirably reproduced. We would draw special attention to the educative methods recommended for the cure of postural defects. They are based upon thoroughly sound principles, and should prove of great service. The early treatment of talipes is another subject of great importance which is ably dealt with. Dr. Forrester-Brown has succeeded in compressing a great deal of information into a remarkably small space. We would suggest that the book would in no way suffer were those portions eliminated which refer to uncommon diseases and the remainder served up in a slightly less concentrated form. With this one criticism we would heartily recommend the book to all those interested in the treatment of children. It is a notable addition to the series of Oxford Medical Publications.

The Tonsils and Adenoids. By IRWIN MOORE, M.B., C.M. Pp. xx., 395. Illustrated. London: William Heinemann Ltd. 1928. Price 21s.—In his preface the author states that his book embodies a number of papers that he has contributed during recent years on the subject of enlarged tonsils and adenoids, the operative technique for their removal, and the control of hemorrhage during and after removal. On these important subjects the work is a mine of information preceded by a useful introduction on the regional and structural anatomy of the tonsils and their functions and the bacteriology of tonsillar affections, followed by a chapter of much value on the tonsils as a sourse of focal infection. The frequent lack of continuity in the text is doubtless due to incomplete co-ordination of these various papers, which also accounts for overlapping and covering the same ground twice over, *e.g.* contra-indications for removal of tonsils on pp. 296, 297 and 298 are largely a repetition of pp. 142 to 149, and to some extent

of pp. 241, 242 and 243. Twice Hugh Ashby is cited on the lymphocyte-forming function of the tonsils, p. 16 and 314. More space should have been accorded to differential diagnosis, *e.g.* between acute tonsillitis and diphtheria, tertiary syphilis and malignant growths, and as only four pages of type are devoted to the entire subject of malignant neoplasms, it would have been better to omit their treatment by diathermy, radium, X-rays or surgical operation, etc., the descriptions of which are so sketchy and very incomplete as to be of little value. The section on the choice of anæsthesia is somewhat disappointing on the question of local anæsthesia now favoured by many operators for tonsil operations on the adult. As an alternative to surface swabbing with cocaine the author suggests "hypodermic injection of 4 per cent. cocaine in a 1 to 2,000 solution of adrenalin, for preference a solution of 2½ per cent. novocaine and 5 per cent. adrenalin," yet very few authorities nowadays resort to cocaine injections at all, and a much less weaker novocaine suffices, and is safe. The author is an enthusiastic convert to the open method of ether anæsthesia, with which we here have been so familiar since its introduction in Bristol towards the close of the last century: Dr. Felix Rood will doubtless be surprised that he is given the credit of introducing open-ether anæsthesia "to this country." The detailed description of the operative technique for enucleation of the tonsils by the guillotine and by dissection, and the instructions for preventing hemorrhage and for arresting it during or after operation are altogether excellent, and enriched with many beautiful illustrations, clear, instructive and helpful, which here, as throughout the book, leave nothing to be desired. These sections and the earlier chapters alone make this monograph of the utmost value to the practitioner.

Editorial Note.

William Harvey and Kingsweston.

At the January meeting of the Bath and Bristol Branch of the British Medical Association a kinematograph film was exhibited showing the experiments which Harvey used to prove his theory of the circulation of the blood. This film was prepared by Sir Thomas Lewis and Dr. H. H. Dale for the celebrations held last year by the Royal College of Physicians to commemorate the tercentenary of the publication of William Harvey's *Exercitatio anatomica de motu cordis et sanguinis in animalibus*. It brought home convincingly the simplicity of the demonstrations which Harvey's great genius had conceived.

It is interesting to recall that at Kingsweston House near Bristol there is a contemporary portrait of Harvey, a replica apparently of one which hangs in the Kent and Canterbury Hospital. The picture is one of a group of family portraits placed in the great hall of Kingsweston by Edward Southwell, who died in 1755.

Kingsweston, which is now the property of Dr. Napier Miles, was formerly the seat of the Southwell family.

Sir Robert Southwell (1642–1702) married Elizabeth Dering, grand-daughter of William Harvey's brother, Daniel: so that it was his great-grand-uncle's portrait that Edward Southwell placed in the panelling at Kingsweston.

Sir Robert Southwell was a Privy Councillor, and had been Secretary of State for Ireland, and three times President of the Royal Society. He had studied medicine at Oxford and anatomy abroad.

The Rev. Richard Warner, in his *Excursions from Bath*, 1801, attributed the picture of Harvey to Sir Peter Lely. The Canterbury portrait has been attributed by Dr. F. William Cock to Cornelius Janssen.

Meetings of Societies.

Bristol Medico-Chirurgical Society.

The first meeting of the session was held at the University on Wednesday, 10th October, 1928, when Dr. W. K. Wills resigned the chair to the new President, Dr. H. L. Ormerod.

DR. ORMEROD read his inaugural address on **"Mental Deficiency,"** reported on page 1 of this number.

The Report presented by the Honorary Secretary, MR. W. A. JACKMAN, showed that during the year 1927–28 eighteen new members had been elected and six resigned leaving a total membership of 209.

Eight meetings had been held during the session, four in the Society's room and four in the Physiological Lecture Theatre of the University. The average attendance had been fifty-five, an increase on that of the previous session, when the average attendance was forty-eight.

The second meeting of the session was held on Wednesday, 14th November, 1928, the President, DR. H. L. ORMEROD in the Chair.

MR. E. WATSON-WILLIAMS showed again the cases of carcinoma of the tonsil that he had brought before the Society in the previous session, to demonstrate the results of various methods of treatment.

MR. T. CARWARDINE opened a discussion on the "**Treatment of Duodenal Ulcer.**"

DR. R. C. CLARKE continued the subject from the medical aspect. These two papers were published on pp. 279, 289 of the *Journal*, Winter, 1928.

In the ensuing discussion MR. A. RENDLE SHORT remarked that the symptoms of duodenal ulcer were often anomalous, especially in women. The irregular meals of the latter perhaps accounted for some of this. In women, too, the differential diagnosis from gall-bladder disease might be very difficult. He thought that *pain* indicated an ulcer, while *discomfort* might mean only a reflex dyspepsia. Hemorrhage was by no means a constant feature of ulcer. Many patients turned to surgery because prolonged medical treatment failed to cure. The mortality of gastro-jejunostomy was 2 or 3 per cent.; 85 to 90 per cent. of operations resulted in cure; the failures were apt to appear at special clinics and produce a distorted view in those conducting the latter.

DR. CARLETON said that he found a mixture of chalk and magnesia in large doses relieved many cases of dyspepsia. The remedy, in addition to being efficacious, was cheap.

DR. VINCENT COATES advised the intensive alkali method of treatment for duodenal ulcer; in his hands it had given 350 successive satisfactory results.

DR. L. N. MORRIS pointed out that the Sippey treatment gave excellent results, and that the patients could remain at work while it was carried on.

DR. D. A. ALEXANDER asked whether belladonna was less helpful than morphia after operation. He thought belladonna might be a factor in producing a post-operative parotitis, owing to the dryness of the mouth.

MR. A. W. ADAMS referred to the difficulty of making an early diagnosis and the possibility of malignant changes. If healing of an ulcer produced stenosis, a gastro-jejunostomy would be needed; but the operation as a rule acted by alkalizing the stomach, and if it failed to do this the result was poor.

DR. O. BODMAN thought that too much attention was given to acidity, and not enough to the condition of the mucous membrane, which was perhaps often primarily at fault.

MR. C. A. MOORE thought the influence of anxiety and worry was considerable, and that the medical profession showed

a high proportion of duodenal ulcers. He thought duodenal ulcer was frequent, and could generally be diagnosed on clinical evidence, without skiagraphy.

DR. J. R. CHARLES said that he found hydroxide of magnesia preferable to the carbonate. An objection to gastrectomy was the risk of achlorhydria, followed by pernicious anæmia.

The third meeting of the session was held on Wednesday, 12th December, 1928, the President in the Chair.

A demonstration was given of the use of the kinematograph in medical teaching. illustrated by films of surgical and pathological subjects.

The fourth meeting of the session was held on Wednesday, 9th January, 1929, the President in the Chair.

DR. BUSH showed a series of skiagrams illustrating pulmonary disease.

MR. A. W. ADAMS read a paper on **"The Rôle of Pyelography in Renal Disorders,"** reported on page 49.

DISCUSSION ON MR. ADAMS'S PAPER.

DR. BUSH spoke of the importance of proper preparation of the patient. The presence of gas in the intestines might be due to a badly-given enema. He agreed as to the value of pyelography, but for mere localization of stones other methods were possible ; for example, two pictures on one plate, one at inspiration, another at expiration. A lateral view similarly would assist. To skiagraph the kidney *at operation* is a very valuable method of localizing the stone, and quite simple to carry out.

MR. W. A. JACKMAN asked what was Mr. Adams's guide as to the quantity of sodium bromide used. Pain was very variably tolerated by different patients, and if this was the guide it might produce considerable variety in normal pyelograms.

MR. DUNCAN-WOOD inquired whether Mr. Adams preferred cocaine or novocaine for urethral anæsthesia, and suggested that caudal anæsthesia might be helpful. He described a case of hæmaturia coming on at 16 years of age so severe that the kidney had to be removed, and after its removal no cause for the bleeding could be found.

DR. NOBLE asked if there was any definite pyelographic appearance characteristic of hypernephroma, and whether Mr. Adams used a manometer while at work.

The fifth meeting of the session was held on Wednesday, 12th February, 1929, the President in the Chair.

MR. H. S. SOUTTAR read a paper on **"The Use of Radium in Surgery,"** an abstract from which is reported on page 19 of this issue.

The sixth meeting of the session was held on Wednesday, 12th March, 1929, the President in the Chair.

PROFESSOR BUCKMASTER, DR. HICKMAN and MISS WILTSHIRE demonstrated experiments illustrating the physiology of the heart.

Clinical Society of Bath.

A MEETING of the Clinical Society of Bath was held at the Royal United Hospital on Friday, 1st February. In the absence of the Past-President, Mr. Blathwayt, the Chair was taken by Mr. A. L. Fuller.

The following cases were shown :—

1. A case of **Raynaud's Disease of twenty-five years' duration in a woman aged 54** was shown by DR. BEVIR, of Timsbury. There was intense pain in the finger-tips, and some superficial ulceration which never entirely healed. The maximum systolic pressure was 220 mm.; there was no albuminuria. Various treatments had been tried.

2. A specimen of **Twins Stillborn at Six Months** was shown by DR. VAISEY, of Bradford-on-Avon. X-rays showed marked disparity between the bony development of the two specimens.

3. Post-mortem demonstrations were given by MR. LEVIS on a case of **Inoperable Hypernephroma involving the Right Renal Vein,** and a case of **Stenosis of the Ureter at the Entrance to the Bladder, with resulting Dilatation of the Ureter and Hydronephrosis.**

4. A specimen of **Aortic Stenosis** was shown by DR. GORDON.

5. DR. WATERHOUSE showed a case of **Rigidity and Tremor in a girl aged 9.** The diagnosis depended very largely on the history, which was not forthcoming. There were fine tremors in both hands and general rigidity, but no pyramidal involvement. There was irregular overaction of the facial muscles. He was inclined to regard the case as either a post-encephalitic condition or as an instance of Kinnier Wilson's progressive lenticular degeneration, though the latter would be rare in so young a child. There were no signs of liver involvement, although in the case recorded of three children in one family cirrhosis of the liver preceded the lenticular degeneration. He was much struck with the facial condition.

DR. GORDON was inclined to regard it as due to lenticular degeneration; the cirrhotic symptoms might come on later. If post-encephalitic, it was not typical, because the mental deterioration had been more or less smoothly progressive rather than occurring in "steps and stairs," as was more usual in post-encephalitic states.

DR. WATERHOUSE agreed that lenticular degeneration was more probable.

6. MR. FULLER showed: (1) Two cases of **Fractured Femur,** which he had wired with aluminium bands, such as are used in fixing the control wires of a motor cycle. There was excellent resulting alignment in each case. (2) A case of **Angioma of the Forearm in a man aged 56,** in which there had been profuse bleeding. There had been an unsuccessful attempt at removal. Asked if injection treatment would be likely to be successful, MR. LEVIS preferred complete excision and skin grafting.

DR. PRESTON KING read a paper entitled "**The Unfit.**" He pointed out the serious financial burden laid on the shoulders of the fit by the ever-increasing numbers of the unfit. He included under the latter term asylum inmates, the mentally deficient, ordinary hospital patients and patients treated under the National Health Insurance Act. He considered that the money spent in training the mentally deficient would be better spent in training A1 children. He criticised the National Health Insurance Act as putting a premium on sickness, and deplored the tendency of the psycho-analyst to regard crime as the result of insanity. He advocated certification of fitness in the case of all would-be parents, a system of birth control

that should be something more than mere prevention of birth, and also that syphilis should become a compulsorily notifiable disease.

A Meeting of the Clinical Society of Bath was held on Friday, 1st March, at the Royal United Hospital, Bath, the past President, Mr. Blathwayt, being in the Chair.

DR. SUTHERLAND showed a case of **Unexplained Chronic Headache of many years' standing occurring in a man aged 35** as a result of war injury in 1914. Wassermann negative. The question of Paget's disease was considered, but the X-ray picture showed no thickening of the bones of the skull, and in view of the history the pension factor was thought to have an important bearing on the symptoms. He also showed X-ray photographs of a case of **Myositis Ossificans.**

DR. DELICATI showed a case of **Long-standing Retention of Urine in a comparatively young man.** None of the ordinary causes for this condition could be assigned. It was suggested that there might be some disease in the neighbourhood of the filum terminale. The distribution of pain in this case might bear out this diagnosis.

DR. WATERHOUSE showed a case of **Apparent Amyotrophic Lateral Sclerosis,** in which, however, there was girdle pain and a disturbance of the temperature sense, but not of the pain sense. These otherwise inexplicable symptoms were thought to be probably functional.

MR. MUMFORD showed a specimen of a **Meningocele** recently removed from an infant with spina bifida.

MR. LEVIS showed specimens of (1) **Cystic Disease of Kidneys and Liver,** (2) **Glioma of Cerebellum in a boy aged 5,** (3) **Glioma of Cerebrum in a boy aged 9.**

DR. VINCENT COATES showed X-rays of a case of **Achalasia Gastrica,** and also read a paper dealing with the **Bio-chemical and Bio-physical Aspects of Infective Arthritis.** After reference to disorders showing Mendelian dominant and recessive characters, he proceeded to give statistics concerning the family predisposition to infective arthritis and rheumatic fever, followed by a short account of the bio-chemical tests he had found most useful and likely to yield results both from the diagnostic and therapeutic points of view.

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Professor E. W. Hey Groves, M.S. (6) ..	14 volumes
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The Surgeon-General of the U.S. Army (13)	1 volume

Unbound periodicals have also been received from Dr. Carey Coombs, Dr. C. Corfield and Professor E. W. Hey Groves.

THE ONE HUNDRED AND TWENTY-SEVENTH LIST OF BOOKS.

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Local Medical Notes.

APPOINTMENTS.

1928 Colonel F. P. MACKIE, I.M.S., V.H.S., O.B.E., M.D., F.R.C.S., F.R.C.P., M.Sc., D.P.H., to be Honorary Surgeon to His Majesty the King.

Royal College of Surgeons.—Professor E. W. Hey Groves has been appointed to deliver the Hunterian Oration for 1930.

EXAMINATION RESULTS.

University of Bristol.—Students of the University have recently passed the following examinations :—

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M.B., CH.B. (*Part II.*).—*Second Examination. Pass :* G. T. Bevir, R. N. O. Burns, R. G. C. G. Carlson, A. M. Davies, G. M. Evans, A. L. Eyre-Brook (with distinction in Anatomy), H. F. M. Finzel (with distinction in Anatomy), F. E. Fletcher, J. D. Hughes, J. J. Kempton R. L. Marks, J. Ridgway, Frances N. Salisbury, O. E. L. Sampson, J. P. P. Stock (with distinction in Anatomy).

L.D.S.—*First Professional Examination. Pass : In Anatomy and Physiology (Completing Examination)*, W. V. Whiteford. *In Dental Anatomy only :* R. E. W. Smith.

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L.M.S.S.A.—T. A. Barnabas passed in Surgery, completing examination. L. P. Gregory passed in Medicine, completing examination.

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Communications referring to the delivery of the *Journal* should be sent to the Editorial Secretary, A. L. Flemming, 48 Pembroke Road, Clifton, Bristol.

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